APPENDIX C. Ecological, Social, and Economic Considerations

Ecosystem Functions and Processes (EF)

EF1: What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

There are three types of special management designations that would potentially be most affected by roading: Research Natural Areas (RNAs), Special Interest Areas (SIAs), and inventoried roadless areas. This analysis does not consider any new road construction into inventoried roadless areas, SIAs, or RNA's.

Currently the Malheur National Forest has one established RNA, four proposed RNAs, five SIAs, and 18 inventoried roadless areas. The Ochoco National Forest Lands administered by the Malheur currently has are three RNAs and one inventoried roadless area.

Future management options for inventoried roadless areas, existing and proposed SIAs and RNAs will be discussed in detail in the Forest Plan Revision NEPA documents.

EF2: To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

In general, road access facilitates both the chances of spreading and the control of forest insects, disease, parasites, exotic plants, and noxious weeds. Whether control efforts are direct (such as burning or de-barking of infested materials) or indirect (an attempt to reduce insect and disease impact by altering stand conditions), roading certainly facilitates those efforts by allowing crews and equipment to access and treat infested sites.

The Forest road system provides a significant vector for the spread of exotic plant species and noxious weeds, through the direct effects of vehicles transporting organisms or through the indirect effects of habitat alteration and creation of early seral, bare soil or patchy ground cover that favors weedy species. The undesirable species may be unpalatable to native wildlife, may crowd out native plant species, or may have other undesirable effects on native species and ecosystems.

Roads that receive heavy use and recurring maintenance provide a continually disturbed substrate that is the preferred seedbed for invading exotics. By providing sites for

infestation, they also provide a local seed source for subsequent spread of weeds to undisturbed forest ground. Periodic maintenance along the roads often spreads the exotic plants over more miles of road, through blading, ditch pulling, transport and or disposal of aggregates and ditch slough materials.

Noxious weed infestations are generally most difficult to control or treat on roads with the highest use; infestations on closed roads are least likely to spread rapidly, and generally easiest to control or treat. Several State and Federal Highways, and many County roads pass through Forest Lands, so close cooperation with those agencies is needed to control noxious weeds.

Another source of noxious weed introduction is through hunters or other equestrians bringing in hay containing noxious weed materials, which can result in the introduction of noxious weeds to dispersed campsites and other Forest areas.

Common weeds are already present in many locations on Forest Lands. Most known infestations of exotic plants occur along the current road system and associated areas with disturbed soils. Noxious weed species documented within the Forest, or along perimeter roads include Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopardum acanthium*), Dalmatian toadflax (*Linaria dalmatica*), St. Johnswort (*Hypericum perforatum*), houndstongue (*Cynoglossum officinale*), tansy ragwort (*Senecio jacobea*), spotted knapweed (*Centaurea maculosa*), diffuse knapweed (*C. diffusa*), and yellow starthistle (*C. solstitialis*). Other widespread exotic plant species include cheatgrass (*Bromus tectorum*), Kentucky bluegrass (*Poa pratensis*), mullein (*Verbascum thapsus*), white Dutch clover (*Trifolium repens*), dandelion (*Taraxacum officinale*), burnet (*Sanguisorba occidentalis*), birdsfoot trefoil (*Lotus corniculatus*), bull thistle (*Cirsium vulgare*), timothy (*Phleum pratense*), intermediate wheatgrass (*Agropyron intermedium*), and orchardgrass (*Dactylis glomerata*).

There are currently more than 2500 identified noxious weed sites on the Forest Lands covered by this analysis, most of which are relatively small. As these sites are discovered they are mapped, and placed on a GIS layer, which is updated periodically. While the Malheur recently conducted an Environmental Analysis for noxious weed treatments, the document did not hold up in court. Region 6 is in the process of creating an Environmental Impact Statement for the Region to address noxious weed issues. But currently the Malheur is limited to using only manual or mechanical treatments on most Forest sites. These treatments include pulling, grubbing out, or cutting weeds. Manual treatments for the known sites with weeds that present significant threats are planned and conducted on annual basis.

Timber has been harvested on the Forests for many decades. Timber sales now have clauses requiring “wash downs” of logging equipment when moving from one logging location to another. This is to control the introduction and spread of noxious weeds. For many years, timber sale, Sale Area Improvement (SAI) plans, and Brush Disposal (BD) plans made provisions for seeding of log decking areas, landings, and concentration points to preclude bare mineral soil going to weed species. Most clear-cuts naturally re-vegetate with desirable native species. In some instances, the Forest Service has

broadcast-seeded desirable forage mixes to improve big game habitat. This also helps prevent the establishment of undesirable plant species. In 1996, the Forest Service issued an order to require use of only certified, weed-free seed. Either native seed or non-germinating seed types are typically used.

There are no documented sites of sensitive plant populations along open Forest roads. There are also no known sites where weed infestations are threatening sensitive plant species either along Forest roads or away from roads.

Dendrological pathogens, insects, and diseases exist on the Forest. But there is no known connection between their occurrence or spread and the existing road system. The road system is not likely to cause introduction or spread of exotic insects or diseases.

Few exotic terrestrial animals are found on the Forest, and those that are present have arrived without the assistance or influence of the road system. For example, avian species such as the European starling, house sparrow, and rock dove have expanded into Oregon, but would have done so regardless of the extent of the road system. Most exotic species are associated with urban areas at lower elevations located off the Forest; population numbers are unknown, but assumed to be fairly low. Wild turkeys have been introduced on the Forest by the Oregon Department of Fish and Wildlife, and their range continues to expand. On the other hand, Oregon is one of the western states with statutes severely limiting the operation of game farms and possession of big game exotics. Road transport of such species therefore is not considered a significant problem, and the road system is not likely to contribute to the significant spread of exotic animal species.

The existing road system on the Forest does provide easy access for the potential introduction of non-native fish species, but it does not appear that the road system has been an important factor in historic introductions of non-native fish species. Historically, brook trout were introduced into most of the lakes on the Forest. These stockings were mostly done with pack strings of mules and horses, or aerially. Smallmouth bass have been introduced into rivers downstream from the Forest. These populations now extend far enough upstream to be within the Forest boundary, at least seasonally. Historically, ODFW did stock rainbow trout at several locations in Forest lakes, ponds and streams. Currently, no stocking is done in any streams on the Forest. Some stocking does still occur in lakes and ponds.

EF3: To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Without road access, insect, disease, and parasite management on the suitable timberland and on other tentatively suitable timberland where management may be needed to meet desired conditions is often not feasible. Forest pathogens and diseases are naturally present on Forest Lands. The road system facilitates the use silvicultural practices to control them, and is not spreading them.

The goal of integrated pest management is to manage resources in a manner that limits or reduces the development or perpetuation of pest problems. Silvicultural treatment of affected or susceptible tree stands can prevent and suppress insects and disease occurrences. As trees grow old, they decrease in growth rate and vigor and become less resistant to insect or disease attack. Severe conditions such as drought and overstocking can reduce tree growth rate, which also reduces resistance to insects or disease.

Periodically, large areas of the Forest have been consumed by wildfire. The trees in these areas over time approach a size and age that is increasingly susceptible to insects and disease. Without management, these stands will continue to grow older and denser and create an environment that is more susceptible to a major outbreak of insects or disease.

EF4: How does the road system affect ecological disturbance regimes in the area?

Understanding disturbance ecology is a key part of ecosystem management. To have an effective ecosystem management policy, resource managers and the public must understand the nature of ecological resiliency, stability, and the role of natural disturbance on sustainability. Efforts to suppress disturbance agents will reduce biodiversity and compromise ecosystem health in the long-term. Attempts to maintain an ecosystem in a static condition are not likely to produce natural conditions in the long-term. Both the economic and biologic consequences of management practices need to be considered. It is not a question of whether disturbance will happen but when, where, and what kind. Forest and project plans must consider and incorporate disturbance information including the types of disturbance that are likely within specific ecosystems, the criteria for predicting where particular disturbances will occur, and the probability of occurrence. This information and the management objectives for those areas can help resource managers better determine appropriate alternatives (Averill, 1995).

The most common disturbance agents affecting the Malheur ecosystems are disease, drought, fire, insects, and wind. It is necessary to consider the association between different disturbance agents. For example, insect outbreaks frequently are associated with drought, and drought creates a greater potential for fire. Increased tree mortality will increase the amount of ignitable fuel, and increase both the chances of fire and its intensity when it does occur. Root disease can predispose trees to attack by insects and root disease and makes trees more prone to wind-throw.

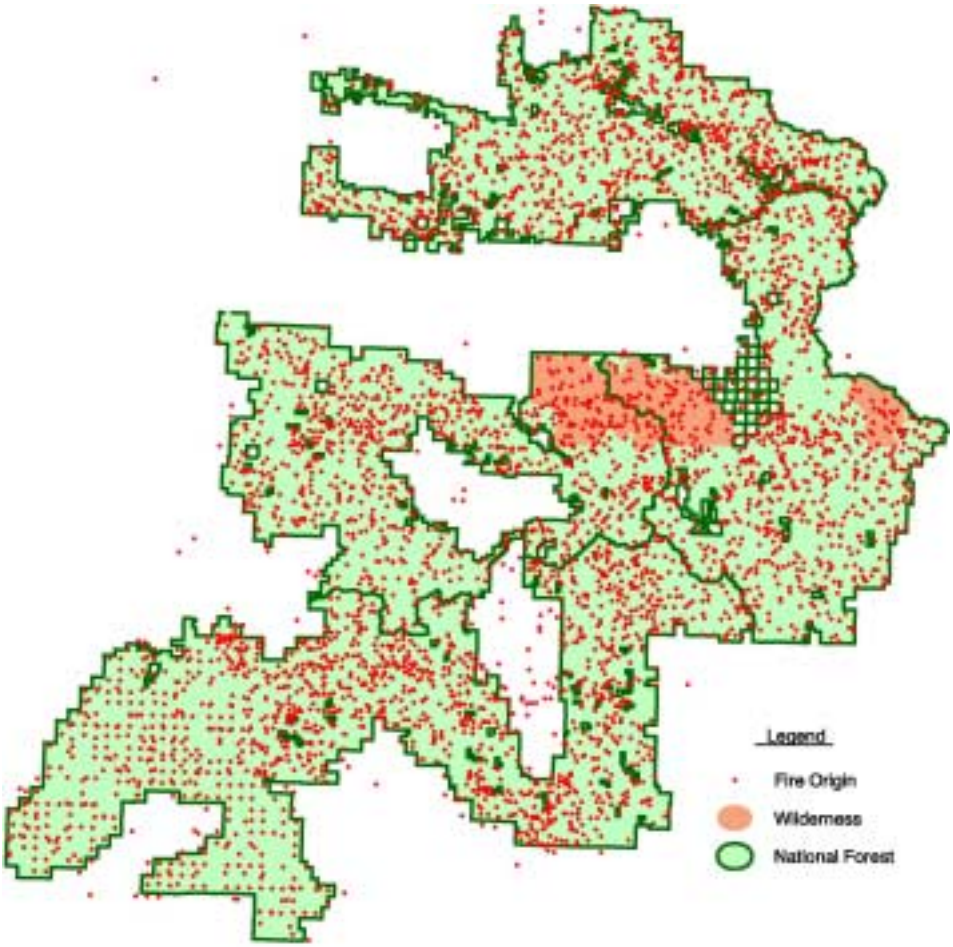
Fire is thought to be the most significant natural disturbance agent in forests of the Blue Mountains. It has shaped the vegetation mosaic for thousands of years, through stand-replacing disturbances on a variety of scales.

Historic Fire Occurrence

Fires influence many segments of the physical and biological forest environment including plant species and communities: insects, parasites, and fungi: and even wildlife habitat patterns and populations. Fire also affects major ecosystem processes and characteristics such as nutrient recycling, energy flow succession, diversity, productivity, and stability. Factors such as fire frequency, duration, intensity and size all have a bearing on these fire effects.

Fire is an important disturbance mechanism in many of the ecosystems on the Malheur and Ochoco National Forests. Intervention in this disturbance cycle through the suppression of unwanted fires has been a predominant policy of the Forest Service and the local Forests during this century. The number of these fires, from 1970 to 2001, ranged from 61 in 1985 to 321 in 1986. Thirty-eight (38) fires burned in excess of 100 acres during that period and 6 of those were over 10,000 acres. The 37,842-acre Summit fire of 1996 was the largest in recent Forest history and is included in this group (A historical fire not included in this group does is the Big Cow Burn which occurred in 1939; its precise size is unknown, but it exceeded 30,000 acres).

Figure 1-- Fire Occurrence Map 1970-2001

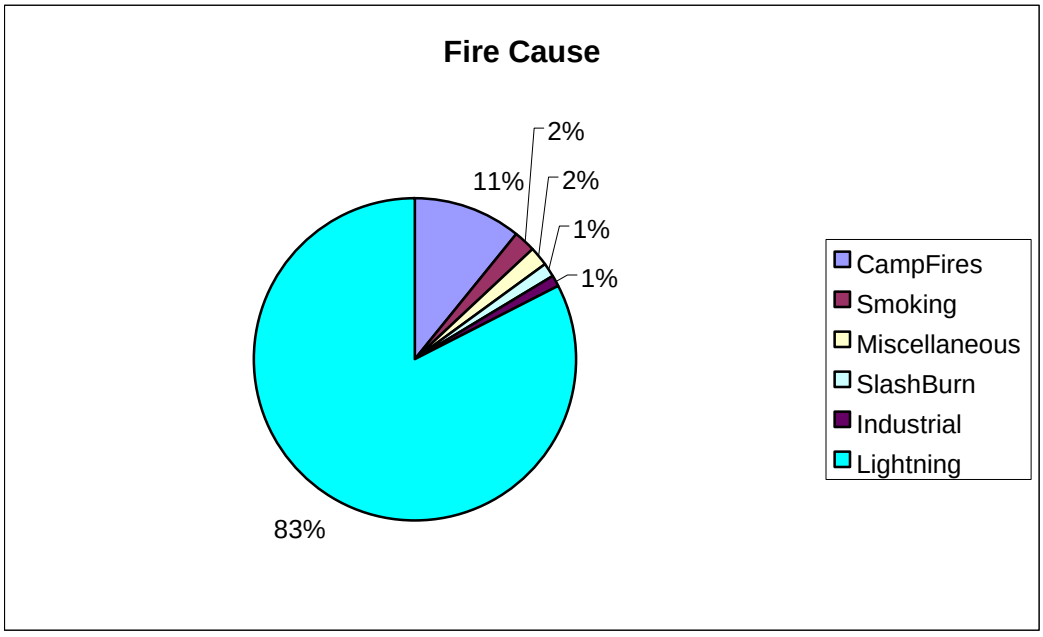


Fire Occurrence 1970-2001

Appendix C TBL 1

CATEGORIES	NUMBER OF FIRES	ACRES BURNED	% OF TOTAL FIRES	% OF TOTAL ACRES
Campfires	530	3,296	11	3.5
Smoking	95	518	2	0.5
Recreational - Other	21	9	1	0.5
Slash Burning	75	1,022	1	1
Industrial	57	1,252	1	1
Miscellaneous	105	542	2	0.5
Lightning	4,060	83,090	82	93
Total	4,943	89,729	100%	100%

Figure 2 --Fire Occurrence 1970-2001



Weather Patterns and Fire Season Parameters

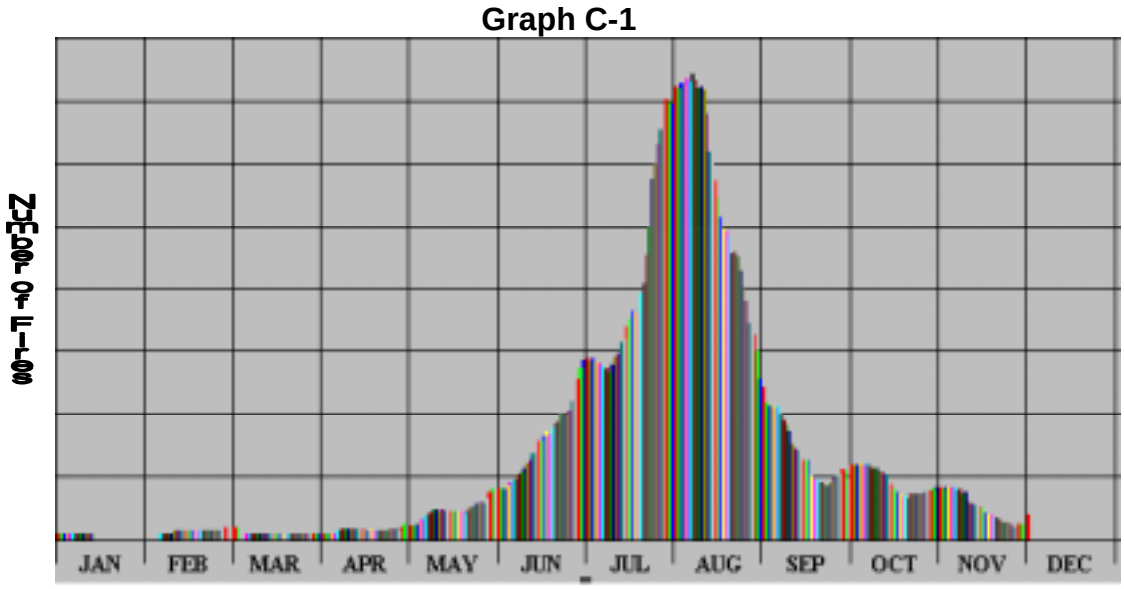
The weather patterns are influenced by several factors including the position and intensity of upper level wind currents, the high and low pressure systems over the Pacific Ocean, and the variations in the topography. Two major weather frontal zones affect the Malheur National Forest. These include a Pacific air mass boundary, which is relatively moist, and a drier continental air mass. A thermal trough migrates northward in spring

and summer, with occasional intrusions of monsoon moisture from the southwest. Strong convection occurring during this time period sets the stage for multiple ignitions. In early summer the drier continental air mass results in a prolonged drying trend. As the Pacific air mass strengthens in the fall, precipitation typically begins to increase, and much of the precipitation is in the form of snow.

Forty to sixty percent of the annual precipitation on the Forest occurs from December through February. The least amount of precipitation occurs from June through October, when temperatures are the high and fuels are the driest. Thunderstorms occur most often during these months.

Vegetative patterns across the Forest are strongly influenced by climatic factors, primarily the amount of rainfall and elevation. The climate becomes more severe as the elevation increases resulting in decreases in species size, composition and plant associations. These factors directly influence the amount of available biomass on the forest floor.

Figure 3– Graph C–1 identifies the lightning wildland fire trends for the Forest from 1970 through 2001.



Seven primary weather stations are used in weather analysis for fire planning, prescribed burning, preparedness staffing and other natural resource data collection needs. Strategically located, each remote automated weather station (RAWS) provides the best representation of the climatic features for each area. Malheur Dispatch downloads weather observations daily as outlined in the *National Fire Danger Rating System Operating Plan* addressed in the Fire Management Plan.

The reason for the changes in extent of burning on the Malheur National Forest in recent

years when compared to the longer-range historical fires is probably result of effective fire suppression, which also allowed fuels to build up to ever increasing levels, combined with drought conditions. When new road access is created on the Forest, some increase in the number of human-caused fires is expected. This does not seriously affect the wildfire situation on the Forest, since access is usually conducive to rapid initial attack and suppression, and roads often provide good firebreaks.

The idea that an unroaded ecosystem will remain in a static, constant condition simply because we do not build roads in the area is not correct. Ecosystems in which the major disturbance regimes (such as fire) have been significantly altered become stressed and vulnerable to change. It is essential to understand and incorporate disturbance processes, whether natural or human induced, in resource management. The consequences of trying to suppress a natural disturbance agent (such as lighting-caused fires) must be considered and possibly counteracted by inducing human caused disturbance events.

Roads generally do not directly affect ecological disturbance regimes, but they are necessary for management access when human-induced disturbance events are part of our active resource management Pre-existing roads have little impact upon insect and disease populations, but new road construction can increase insect and disease populations when host material is cut and not treated or removed, or host trees are damaged during construction. The damaged host trees can serve as foci for insect and disease attack, allowing populations to build up and spread to adjacent lands.

EF5: What are the adverse effects of noise caused by developing, using, and maintaining roads?

This is not an issue at the Forest scale. It should be addressed at the sub-forest scale if it is an issue at that scale.

Aquatic, Riparian Zone, and Water Quality (AQ)

This forest scale roads analysis included determining the relative watershed and aquatics risks of the recommended minimum primary road system. The ratings for these roads or road segments are displayed in the road tables in Appendix A. All classified roads, regardless of maintenance level, were used in the portion of the analysis that determined overall watershed and aquatic risks for Forest Lands in each 6th level HUC (Appendix D). Considering all classified roads allowed a broad-scale assessment of the risk to watershed function associated with the entire road system rather than just the potential minimum primary road system. The broad forest scale analysis provides the basic framework for prioritizing analyses at the watershed or project level. Sub-forest scale analyses should identify site-specific areas affected by the road system and opportunities to address concerns.

Opportunities to address general road-related aquatic risks are listed in Chapter 6 of the main Roads Analysis document.

AQ1: How and where does the road system modify the surface and subsurface hydrology of the area?

Storage and movement of water through the soil profile as subsurface flow regulates and sustains base flows. Roads expand the channel network, convert subsurface flow to surface flow, and reduce infiltration on the road surface. All of these factors affect the overall hydrology in a watershed, particularly the quantity and timing of flow.

When road ditches are constructed they become artificial channels that expand the natural channel network. Road cuts also intercept subsurface flow and convert it to surface flow. An expanded channel network augments peak flows, since water traveling as concentrated surface flow reaches the channel faster than water traveling as subsurface flow (Wemple et al. 1996). Reduced infiltration contributes to additional surface flow, since water does not infiltrate for storage in the soil profile, but rather runs off as overland or surface flow. When roads disrupt these processes, more water becomes available during peak flows, and less water is available to sustain base flows.

While the effects of roads on the hydrology of an area depend largely on local factors, road density is an indicator of the road system's relative potential for modifying surface and subsurface hydrology; the higher the road density, the greater the potential for the road system to affect the hydrology. Mid-slope and lower-slope roads generally have a greater potential to intercept subsurface flow than roads on the upper slope.

Four categories of road densities were calculated for each sub-watershed (6^{th} level HUC): total roads, total maintenance level 1-2 roads, roads within 200 feet of streams, and maintenance level 1-2 roads within 200 feet of streams. Sub-watersheds were then classified as having extreme, high, medium, or low potential for hydrological effects based on relative road densities (see Appendix D – Watershed/Aquatics Risk Assessment). Appendix D identifies the range of values, which represent the low, moderate, high, and extreme ratings for road densities as well as other parameters used in questions AQ 1-6, AQ 9-12, and AQ 14.

AQ2: How and where does the road system generate surface erosion?

Surface erosion is highly dependant on soils, road surfacing and condition, road grade, traffic volumes, and the effectiveness and spacing of drainage structures. The greatest surface erosion problems occur in highly erodible terrain, particularly landscapes underlain by granitic soils, soils of the Clarno formation, and certain highly fractured or weathered rock types. Studies have found that sediment delivery to stream systems is highest in the initial years after road construction, although raw ditch-lines and road surfaces with little binder can remain chronic sources of sediment. Native surface roads

(mostly maintenance level 1-2 roads) are generally greater chronic sediment sources than surfaced, higher standard roads.

Drainage structure, function, and spacing are key to minimizing the amount of surface flow, which directly affects surface erosion. The spacing of drain or ditch relief structures depends on the road gradient, road surface and ditch soil types, runoff characteristics, and the effects of concentrated runoff on slopes below the road. FSH and other manuals provide guidelines for drainage structure spacing. Drainage structures should be close together on silt-sand soils with little to no binder on steep slopes and further apart on gravel road surfaces with moderate binder and little to no fines on flat or minimum grades.

To evaluate surface erosion potential, we determined the amount (percent) of soils with high erosion potential in each sub-watershed. Sub-watersheds were determined to have a high, medium, or low risk of water quality effects from surface erosion. Total road density, density of maintenance level 1-2 roads, density of road miles within 200 feet of a stream, density of maintenance level 1-2 roads within 200 feet of a stream, and the density of road-stream crossings were all used as indicators of the potential for eroded materials to be delivered to the stream system (see Appendix D).

AQ3: How and where does the road system affect mass wasting?

The sensitivity of an area to mass wasting depends on the interaction of the soils and underlying bedrock, slope steepness, and the subsurface hydrology. Geologic features that affect stability include faults, fractures, shear zones, rock competency (rock strength and resistance to erosion), the slope of bedding planes, and contact zones between different formations. The most important characteristics related to soil mechanics affecting stability include soil type (soil friction and cohesion), slope gradient, ground water, seepage forces, and tree roots.

Mass wasting is not a widespread concern on the Malheur National Forest. However, some degree of mass wasting activity is a natural watershed process in some areas of the Forest. Any ground disturbing activities in areas susceptible to mass wasting carry some inherent risk of increasing the level of activity above natural levels. Overall stability in these areas is closely tied to erosion and/or concentration of water into areas in excess of what would naturally occur.

In areas susceptible to mass wasting, the location, design, cross-drain spacing, and drainage maintenance are essential to minimizing road-related mass wasting activity. The risk rating tables in Appendix D identifies watersheds where the geologic sensitivity is highest (generally most prone to mass wasting activity).

Project-level NEPA analyses and project or sub-watershed road analyses should evaluate existing and potential road mass wasting problems related to existing roads and any proposed new road construction.

AQ4: How and where do road-stream crossings influence local stream channels and water quality?

Road-stream crossings have the potential to directly and indirectly affect local stream channels and water quality. Poorly designed crossings directly affect hydrologic function when they constrict the channel, when they are misaligned relative to the natural stream channel, or when improperly sized culverts are installed. Road-stream crossings also act as connected disturbed areas where water and sediment are delivered directly to the stream channel.

Increasing peak flows through the extended channel network (see AQ1) increases the energy available for in-channel erosion, which affects stream stability and increases sedimentation. The biggest water quality concern associated with the road system is sediment delivered to the stream system through connected disturbed areas.

The density of road-stream crossings in each 6th level sub-watershed was used to determine those watersheds where the road-stream crossings posed the highest risk to local stream channels and water quality. Watersheds were determined to have an extreme, high, medium, or low risk based on stream crossing density (see Appendix D).

AQ5: How and where does the road system create potential for pollutants, such as chemical spills, oils, deicing salts, or herbicides, to enter surface waters?

Anywhere roads run adjacent to or across streams or floodplains, there is some risk that spilled pollutants could enter streams. Poorly cross-drained ditches may transport spilled pollutants to standing or flowing water bodies. Generally, these pollutants are not transported in bulk across the Malheur National Forest except where noted below.

County weed programs do use herbicides on the Forest and will create some potential for pollutant contribution in the case of vehicle or equipment accidents. Log haulers and other heavy equipment associated with harvest and road activities carry sufficient fuel and oil to cause localized water quality problems should an accident occur. This is minimized by stipulations in timber sale contracts that specify haul speeds, fueling practices, weather or road moisture limitations, and other aspects of the operations. Forest road maintenance crews are also trained to utilize safe areas and procedures for refueling heavy equipment. The potential for pollutant associated with log haulers would be highest on those roads commonly used for timber harvest access, particularly maintenance levels 3-5 roads.

The application of magnesium or calcium chloride or lignin sulfonate for road dust abatement may affect water quality, but past studies have found that the effects can only be detected after many years of repeated year-round application (Heffner 1997). Typically, magnesium or calcium chloride is only applied 1-2 times per year on roads requiring it. This may be a concern in areas where aquatic threatened, endangered, and sensitive species are present.

Magnesium and calcium chloride may be used during the winter months as de-icing agents, although this has not been a common practice on highways that run through the Malheur National Forest. If and or when deicing salts are used, the application rates are often higher than for dust abatement, the chemicals do not bind with the soils (or pavement in the case of de-icing), and the frequency of applications is generally higher. For these reasons the use of these salts for de-icing purposes has a higher potential for affecting water quality. The potential for this is limited to Federal, State and County highways.

AQ6: How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity?

The road system is hydrologically connected to the stream system where there are connected disturbed areas (see AQ 1, 2 and 4). This includes road-stream crossings, as well as areas where roads are adjacent to stream courses and there is an insufficient buffer strip between the road or road drainage structures and the stream system. As discussed in AQ1, the extended channel network can increase peak flows and decrease base flows. As discussed in AQ2, water quality can be degraded where connected disturbed areas increase sediment delivery to the stream system. Connected disturbed areas with highly erodible soils are the most likely to deliver sediment to the stream system.

All of the factors identified in AQ 1-4 were used to develop an overall watershed risk rating (see Appendix D). The overall risk rating represents the potential for hydrologically connected areas to adversely affect both water quality and water quantity. Five of the 13 sub-watersheds with overall watershed risk ratings of extreme (E) are in the Camp Creek watershed of the Middle Fork John Day sub-basin.

Sub-watersheds with extreme and high-risk ratings would be the priority for sub-forest scale analysis. Analysis at this smaller scale would identify site-specific problem areas and opportunities for reducing the effects of the road system on water quality and quantity.

AQ7: What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?

Downstream beneficial uses of water are listed in the "Department of Environmental Quality 1994/1996 303(d) List of Water Quality Limited Waterbodies & Oregon's Criteria Used for Listing Waterbodies." Beneficial uses listed for the John Day, Malheur Lake and Malheur River basins, which could be affected by Forest road management and use include:

- Salmonid fish rearing & spawning

- Resident fish & aquatic life
- Anadromous Fish Passage,
- Fishing, wildlife & hunting
- Public, private, and industrial water supply,
- Irrigation, livestock watering,
- Aesthetic quality, boating, and water contact recreation.

Threatened, endangered and sensitive (TES) fish species are of particular concern as immediate downstream beneficial uses in most streams on the Forest. In terms of DEQ's list, "resident fish and aquatic life," and "salmonid fish spawning and rearing" are the beneficial uses that have the greatest potential to be adversely affected by road management and use on the Forest.

Demands for most water uses are following an increasing trend. With increases in population, public and private lands recreation, agriculture, and industrial uses of water will continue to increase. Controversy over appropriate uses of water will also grow. Most major river basins in the West are fully or over-appropriated, adding complexity to the problem of determining the best uses of state waters. This also applies locally, to the John Day, Malheur Lake and Malheur River basins.

Sedimentation, water temperature and stream flow are important components of fish habitat that can be affected by road construction, management and use. These are addressed in AQ 1-4 and 6. Chemical spills (e.g. herbicides, or petroleum products) can have direct effects, including mortality, on fish present in the stream below the spill. AQ 5 addresses the risk of this potential effect.

AQ8: How and where does the road system affect wetlands?

Roads can affect wetlands directly by encroachment, and indirectly by altering hydrologic surface and subsurface flow paths. Encroachment results in a loss of wetland area directly proportional to the area occupied by the road. Alteration of the hydrologic flow paths can affect wetland function with the effects extending beyond the area occupied by the road, and in many cases beyond the area of the meadow. These effects can include:

- Constraining and diverting surface and subsurface flows.
- Dewatering wetlands.
- Concentrating and accelerating runoff.
- Intercepting groundwater flows.
- Accelerating soil erosion and the loss of soil nutrients.
- Triggering site conversion from wetland to upland species.
- Degrading water quality.
- Reducing base flows, increasing peak flood flows and flood frequencies.
- Reducing groundwater recharge.

Over the last decade, there has been relatively little new road construction on the Forest, and Forest Plan standards include protecting and maintaining the integrity of "unique and special habitats," which include wet meadows. However, many roads were constructed across meadows prior to 1990. Along with other Forest management activities, such as livestock grazing, these roads have contributed to the modification of many meadow areas and associated streams across the Forest.

AQ9: How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migration, and the movement of large wood, fine organic matter, and sediment?

Roads can directly affect physical channel dynamics when they encroach on floodplains or restrict channel migration. Floodplains help dissipate excess energy during high flows and recharge soil moisture and groundwater. Floodplain function is compromised when roads encroach on or isolate floodplains. This can increase peak flows. When peak flows increase, more water is available for in-channel erosion, which, in turn, affects channel stability. Restricting channel migration can cause channel straightening which increases the stream energy available for channel erosion. This can also result in channel instability. Altering channel pattern affects a stream's ability to transport materials, including wood and sediment.

We used the miles of road within 200 feet of a stream/river as an initial indicator of where the road system might be affecting physical channel dynamics. For the road-by-road analysis of the primary Forest road system we supplemented this with personal knowledge of the roads. These concerns are greatest on floodplains with reaches where streams develop a natural meander. These are typically low gradient reaches.

AQ10: How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what degree?

Migration and movement of aquatic organisms are primarily restricted at road-stream crossings with culverts. Generally, the restriction is on upstream migration, although downstream migration can also be affected. This results from hanging culverts, high flow velocities in culverts, and inadequate depths for fish migration. In some locations, migration barriers could be desirable to protect native species. No examples have been identified where existing culverts are providing "beneficial" barriers. While culverts can affect the migration of amphibian species, the greatest concern is the effect on fish species.

Redband trout are the most widely distributed fish species of concern on the Malheur National Forest. Other native species of concern are: Chinook salmon, Steelhead, cutthroat and bull trout. There are many known partial migration barriers on the maintenance level 3-5 roads on the Malheur National Forest. A culvert inventory to identify undersized culverts and fish barriers is ongoing. There are an estimated total of about 700 culverts on fish-bearing streams on lands administered by the Forest. It appears that about 80% of them are barriers to fish passage or potential barriers to some life stages of fish during some flow conditions.

AQ11: How does the road system affect shading, litter fall, and riparian plant communities?

Riparian communities play a vital role in providing shade and litter fall to streams. This includes input of invertebrate food sources for fish, which is especially important in small headwater streams. Removal or degradation of these communities can affect litter fall and water temperatures, which in turn, affects aquatic habitat. The road system directly affects riparian communities where it impinges on riparian areas. Vegetation tall enough to provide shade, or litter fall, is not allowed to grow on the driving surface of an open road. This type of vegetation is also often limited on the fill slope. Roads can indirectly affect riparian communities by intercepting surface and subsurface flows so that soil moisture is changed and riparian vegetation is replaced with upland vegetation. Roads with the most potential for this type of effect are generally those within 150 – 200 feet of streams.

AQ12: How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

Roads adjacent to streams with fish are the most likely to contribute to fishing and poaching. State fishing regulations are in place to protect federally listed (T&E) fish species. Poaching is not generally considered a major issue on the Malheur National Forest and is not thought to significantly affect populations of at-risk aquatic species.

The road system contributes to direct habitat loss where roads restrict channel migration (AQ9) and where mass movements associated with roads directly impact stream channels (AQ3).

AQ13: How and where does the road system facilitate the introduction of non-native aquatic species?

The existing extensive road system on the Malheur N.F. does provide easy access for the potential introduction of non-native fish species. But it does not appear that the road system has been an important factor in historic introductions of non-native fish species. Historically, brook trout were introduced into most of the lakes on the Forest. These stockings were mostly done with pack strings of mules and horses, or aerially. Smallmouth bass have been introduced into rivers downstream from the Forest. These populations now extend far enough upstream to be within the Forest boundary, at least seasonally. Historically, ODFW did stock rainbow trout at several locations in Forest lakes, ponds and streams. Currently, no stocking is done in any streams on the Forest. Some stocking does still occur in lakes and ponds.

Roads provide primary access routes for the introduction of weeds and other non-native plant species. Many Forest roads are within riparian areas. As a result, several common

introduced noxious weeds, such as dalmation toadflax, are common in riparian areas in several locations across the Forest.

To date, we have no confirmed sites of aquatic noxious weeds on the Forest.

AQ14: To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?

Redband trout (sensitive species) are found in almost all perennial streams on the Forest. Thus, virtually all of the Forest road system overlaps with areas that have species of interest.

The portion of the Forest with the most aquatic species of interest is in the upper main-stem John Day River. Within this sub-basin, three sub-watersheds have all five of the species of interest that were tracked in this roads analysis: Deardorff Creek, Rail Creek and Reynolds Creek. There are also three sub-watersheds with four species present: Indian Creek, Vance Creek and Lower Canyon Creek.

Within the Middle Fork John Day River sub-basin, three sub-watersheds have four of these species present: Granite Boulder Creek, Vinegar Creek and Clear Creek.

This analysis also identified specific roads in the primary Forest road system which were in close proximity to streams with sensitive species populations, and which may be affecting these populations (see Appendix A, Primary Road System Table and Appendix B, Primary Road System Maps). Table D-9 in Appendix D indicates which 6th level HUCs include "stronghold" areas for aquatic TES species.

Terrestrial Wildlife (TW)

TW1: What are the direct and indirect effects of the road system on terrestrial species habitat?

Roads have several effects, mostly adverse, on wildlife habitat. Road construction removes habitat, increases the likelihood of disturbance, increases competition among some species, alters animal and plant species composition in affected areas and creates movement barriers.

Initial road construction causes immediate loss of habitat within the roadway, by converting habitat into non-habitat. Depending upon the amount and kind of maintenance and use, the conversion can be permanent, unless vegetation grows in the roadway again. The magnitude of these effects is generally in proportion to open road density.

Greater access means reduced seclusion habitat, which is very important to some species, including wolverines and wolves, which use roaded areas less than unroaded areas. For these species, the roads themselves are not the primary problem, the loss of seclusion habitat is.

Roads often restrict the movements of small mammals, and consequently can function as barriers to population dispersal and movement by some species. This can reduce habitat available for dispersing individuals and reduce the rate of gene flow within a population. The wider the road and the higher the standard, the more likely it is that an animal will hesitate or not cross it.

In the past, roads were often constructed in riparian areas, which either degraded or eliminated riparian vegetation. About 75% of the terrestrial wildlife species found in the Blue Mountains are either directly dependent on riparian habitats, or utilize them more than other habitats (Thomas et al., 1979). Wildlife use these areas for water, shade, food and cover. These areas often provide travel corridors or migration routes. Elk and deer often use these areas for calving and fawning. Several wildlife species are strongly associated with riparian hardwoods, including Lewis's woodpecker, Williamson's sapsucker, red-naped sapsucker, downy woodpecker, and willow flycatcher. Aspen, in particular, is favored by several species for foraging and breeding.

Roads constructed through aspen stands can reduce the size of the clone and influence the water table either adversely or positively affecting aspen habitat. Aspen is a very important habitat type, used by many species for foraging and breeding. Some species, such as the red-napped sapsucker, are highly associated with aspen; they will occur elsewhere, but their density is much higher in aspen. On the Malheur National Forest, some of the greatest diversity of bird species per unit area occurs in aspen stands.

Snags, as well as live trees, are removed during road construction. Few snags will ever be allowed to remain near open roads, because they present a hazard to the public, and because they are available as firewood. Where road densities are high, the average snag density can be expected to be very low.

Roads also increase the amount of "edge" habitat that is preferred by some species. This can be a disadvantage to other species as a result of increased competition. As an example, the brown-headed cowbird is a brood parasite, laying its eggs in the nest of another species. Habitat created by road construction can allow brown-headed cowbirds into areas that previously were not suitable habitat. Some species, especially warblers, have very high nest failure rates when parasitized by brown-headed cowbirds.

Roads can also have an effect on forage for herbivores. In the past, road cut slopes were stabilized using various seed mixtures, often containing non-native species. These species now occur within the forest as well as along roads. In some cases, these species are consumed as forage and probably don't adversely affect herbivores; however, native plant species are reduced in areas occupied by non-native plants, which can result in a reduction in forage for some herbivores. For instance, orchard grass is not highly palatable, but it occupies areas historically occupied by native plants. On the other hand,

clovers, many of which are non-native, are highly palatable and are consumed by birds and mammals.

Most noxious weeds are introduced along roads. Noxious weeds are not palatable, and they have the potential to become established and occupy sites otherwise occupied by native forage species. The spread of noxious weeds has become a much greater concern in recent years.

TW2: How does the road system facilitate human activities that affect habitat?

Roads allow a higher frequency and density of humans than would occur otherwise. In addition to hunting and fishing, common activities on the Malheur N.F. include mushroom and antler gathering, bird-watching and sightseeing. These activities do not substantially modify habitats, but they do increase disturbance, which makes habitat less useable for some species. Such species as wolverine, wolf, and elk appear particularly sensitive to disturbance. Animals could be displaced from high road density areas, concentrating use into smaller areas. Increased disturbance can cause reduced reproductive success for susceptible species, such as the northern goshawk and bald eagle.

Typically, greater access is a precursor to higher levels of management. Many Forest roads provide access for timber harvest and associated activities. Harvest often fragments and degrades habitat, at least for those species that prefer interior habitat to edge habitat.

Roads provide additional access for camping. Near campsites, vegetation is often removed or altered. More miles of road also reduce the unroaded areas available for recreation. Recreationists seeking an unroaded experience are concentrated into limited areas, such as wilderness areas or roadless areas, which are being used increasingly. This can further reduce refugia for animals sensitive to disturbance.

Another important human use on the Forest is firewood gathering. This occurs mostly within 150 feet of open roads and results in a loss of snags and down wood in these areas.

There are currently about 350 miles of Forest roads that are also used as snowmobile routes. Snowmobiles provide access to higher elevations during seasons formerly not used by very many people. They also compact snow, which is believed to allow carnivores, such as coyotes and bobcats, into higher country, which can result in increased predation on showshoe hares and squirrels during the winter.

TW3: How does the road system affect legal and illegal human activities? What are the effects on wildlife species?

Many people are not willing, or in some cases, not capable of hiking far to hunt or trap. Increased road density can mean increased hunting, trapping and poaching. Poachers tend to stay on roads because their activity is illegal, and they want to kill and remove the

animal before getting caught. Constructing roads into previously unroaded areas further reduces refugia for animals to escape from hunters, to eat and rest.

Snowmobile routes into high country, most of which follow roads, facilitate trapping. Areas that can now be accessed by a snowmobile in a day, historically took several days to access by an individual on snowshoes. The high country, which was only used by trappers willing to spend several days pursuing their prey, is now available to the recreational trapper. In some areas, trapping can seriously deplete populations.

Increased road densities can lead to increased accidental road kill. Roads with the highest standards, such as Federal and State highways, have the highest rates of animal mortality. However, animals can be and are killed on any standard of road as long as any types of vehicles use them.

TW4: How does the road system directly affect unique communities or special features in the area?

Unique habitats identified in the Malheur N.F. LRMP include meadows, rim rock areas, talus slopes, cliffs, animal dens, wallows, bogs, seeps and springs, and aspen stands. It also includes direction to maintain or enhance communities of mountain shrubs. One particular species of concern is mountain mahogany. Roads that are built through, or near sites with these features can remove or modify unique habitat.

Roads built adjacent to rim-rock features, talus slopes, or cliffs, affect these sites primarily by disturbance of species that use these features for nesting or denning.

Roads built across, or adjacent to those unique habitats associated with water, i.e. the meadows, wallows, bogs, seeps and springs, can directly affect these habitats by changing the ground water movement at the site or by eliminating small patches of habitat. And since these sites tend to be focal points for many wildlife species, the disturbance factor associated with the road is also usually higher than average.

Mountain mahogany is used as forage by big-game animals and breeding and foraging habitat for many other species. On the Malheur National Forest, mountain mahogany is not reproducing successfully in most areas for many reasons, so the loss of individual plants or stands is important to its distribution on the forest.

Aspen on the Malheur National Forest is about 5% of what was historically and now occurs only as a few individual trees or stands of a few acres. A road built through an aspen clone has the potential to allow degradation or in some cases entirely remove the clone. Because individual trees in clones are genetically identical, loss of the clone can mean loss of genetic material.

The minimum primary Forest road system identified in this Forest-wide Roads Analysis includes main travel routes through the Forest, routes to administrative sites such and lookouts, and routes to established recreation sites such as campgrounds and trailheads.

These are all routes that have been in place for at least several years. This analysis does not propose any new roads, or recommend closure or decommissioning of any existing roads. Therefore, this analysis does not address any substantial changes in the effects of the existing road system on wildlife.

Proposals for new roads, or for roads to be closed or decommissioned, will be addressed using the NEPA process, and with more site-specific (watershed, or sub-watershed scale) roads analyses.

Economics (EC)

EC1: What are the monetary costs associated with the current road system? How do these costs compare to the budgets for management and maintenance of the road system?

The monetary costs associated with maintaining the current road system is covered in detail in Chapter 2 of the main Forest-scale Roads Analysis document. Chapter 2 also includes discussion of recent and foreseeable road maintenance funding levels and potential funding sources. Chapter 5 includes a discussion comparing the estimated costs of maintaining the current road system to the costs of maintaining the recommended minimum primary system alone.

The current road system provides both positive and negative cash flows. The major source of revenue associated with roads is timber sales. Direct costs include recurrent road maintenance and resource restoration or protection costs related to increased motorized use in roaded areas. Currently, direct costs greatly exceed direct revenues. However, these costs can be mitigated or minimized if roads are properly constructed, reconstructed, and maintained, roads that do not need to remain open are closed, and roads that are no longer needed are decommissioned. Given current agency funding and sources of revenue, any increases in open road mileage would compound the problem. Virtually all foreseeable road related projects are likely to result in fewer miles of open roads on the Forests.

The challenge for the IDT was to develop a process to determine which roads comprise the potential minimum primary road system, which we defined as:

> ***Forest arterial, collector and local roads that, for the foreseeable future, will need to remain open and maintained to an Operational Maintenance Level of 2 or higher, to provide for public and or administrative access.***

All of the roads that were selected were determined by the IDT to have high resource values or high recreation or both. The group of roads selected represents only 22% of the total Forest road system miles. Some of the primary system roads do not meet current or

future access and land management needs, and others are currently being maintained to a higher standard than necessary to meet those needs.
The IDT also determined that even if available funding was shifted from low value roads to higher value roads, total maintenance needs of the current Forest road system can not be met in the long-term without significant increases in funding. Currently available funding is not adequate to even maintain only the recommended minimum primary road system. But the information from this Forest-scale analysis will help guide the changes that need to be made to the road system or road management, in order to reduce overall road maintenance obligations of the Forest.

EC2: What are the indirect economic contributions of roads including market and non-market costs and benefits associated with road system design, management, and operations?

Although the direct costs of road construction, maintenance, and mitigation measures exceed the direct revenues resulting from timber and other commodities, many resource management objectives could not be accomplished or would cost a great deal more without an adequate road system. EC-3 considers the direct effect of road systems upon local economies. There are broader benefits and costs associated with the road system and how it is managed, which include the impact of the road system on other activities and values.

The road system provides many benefits to fire protection and suppression, prescribed burning, recreation, research, and passive-use values (this is further addressed by the answers to social questions, such as SI-4). Examples of costs include road impacts to water quality, riparian habitat, sedimentation of fish habitat, and fragmentation of species habitat resulting from management activities.

This roads analysis identified recommended changes to the minimum primary road system that can help resolve some of these issues and the road costs associated with those changes. Recent sub-Forest scale road analyses have also identified a relatively large number of roads in specific areas that are no longer needed for management activities. Decommissioning of roads that are no longer needed for management will also help resolve some of these issues, by reducing road densities, road impacts, and road maintenance costs. The guidelines in Chapter 5 also provide potential opportunities to reduce road impacts and maintenance costs.

EC3: What are the direct economic impacts of the current road system and its management upon the communities around the forest?

Commercial road-related activities, such as fuels management, timber management, collection of special forest projects, forage use, energy and mineral extraction, tourism and road management work, can have different short-term and long-term effects on the local economy. On the Malheur and Ochoco National Forests, fire suppression activities currently result in large but intermittent influxes of money into the local economy. Fuels

management activities, on the other hand, are recurring economic activities that are increasing in frequency and magnitude. Road management activities such as road building and removal represent one-time stimuli to the economy, but maintaining roads is a recurring stimulus.

Range permittees and tourism operations tend to involve seasonal, but steady, use within an area and generate a consistent flow of economic activity.
Activities of a recurring nature and those that foster manufacturing industries and produce value-added products generate relatively greater numbers of sustainable direct and indirect jobs and income than activities where expenditures are largely associated with equipment or occasional events. The effect of the level of activities is relatively significant in remote areas and small communities where economies are less diversified and distance to markets is great. Economic and social effects will be greater on local groups whose livelihoods and cultures are tied more closely to forest activities, thus resulting in more immediate and direct impacts to their daily lives. The job and income impacts associated with the use of forest roads can be estimated.

Non-commercial road related activities include primarily recreational uses. Recreational use is increasing, and this increase also results in an increase in associated revenues being brought into local communities.

Commodity Production (TM, MM, RM, SP, SU)

Timber Management (TM)

TM1: How does the road spacing and location affect logging system feasibility?

This question is most applicable at the sub-forest scale during project analysis. It is an important consideration, however, for determining timber suitability, management area allocations, and economic efficiency during a forest plan revision.

The most efficient road spacing that would maximize timber stumpage values is not feasible because it would result in road densities and resource impacts conflicting with other resource management objectives. Generally, road construction is only allowed where it is determined to be economically and technically necessary to achieve resource management objectives.

The majority of sales on the Malheur are logged with ground-based equipment. The trees are either felled by hand with chain saws or cut mechanically with a “feller-buncher” and then yarded to the landing with rubber tired grapple skidders or tractors. In general, a road spacing of 1,600-2400 feet would be economical for ground-based skidding.

In general, close road spacing results in quick turn times and higher production that reduces yarding cost and increases stumpage value. Although closer road spacing can increase the total road cost due to more roads, the total cost can be reduced with the use of temporary roads.

Cable logging systems are also common, and are frequently utilized for timber harvest. Road location is particularly important for cable logging. Most cable logging systems employ uphill yarding to roads located at the top of the unit. Roads are typically located along the "break" (where the slope changes from gentle to steep), to provide feasible cable deflection, which helps increase production and reduce ground disturbance. Long cable yarding distances (greater than about 1,600 feet) require larger size equipment and wider roads. The amount of steep slope cable yarding opportunities will be analyzed during the suitable timberland analysis for the Forest plan revision.

Helicopter logging has been used on the Forest, on a limited basis. For the type of timber currently available and considering current and recent market conditions, helicopter logging is usually not feasible because it is extremely expensive. Much of the Forest administered by the Malheur is located at moderate to high elevations. With increasing elevation, a helicopter's lift capacity is progressively reduced, making helicopter logging even more expensive as elevations increase. Helicopter logging feasibility can be improved by locating roads and landings that allow short yarding distances (less than ½ mile).

But usually the only way a helicopter system can be used economically on areas with typical stumpage values is to have several other low-cost, ground-based units included in the timber sale to offset the cost, or to have a large number of helicopter units to spread the costs of mobilizing the equipment needed.

The existing road system spacing and location is adequate to allow feasible harvest of most timber stands with either ground based or skyline logging systems in most areas identified as suitable for timber harvest in the Forest Plans. But the timber program projected in the 1990 Forest Plans will require some additional primary access roads to meet needs for resource management. There are a few areas on the Forest that are shown as suitable for timber harvest in the Forest Plans that currently have little or no motorized access, either because right-of-ways have not been secured, or access roads have not yet been constructed:

- There is insufficient public access into the Roberts Creek drainage and the area to the east of Roberts Creek on the Prairie City District. In these areas, Forest and private lands are intermingled in a "checkerboard" land ownership pattern, which severely restricts public access.

- The Forest currently has no right of way to the Forest collector road 4795, which accesses lands in and around the Utley Butte Wildlife Emphasis Area on the Emigrant District (prior right of way has been terminated).

- There is insufficient access into the area on the west side of the Deerhorn Creek drainage and in the Little Butte drainage on the Blue Mountain District.

- There is insufficient access in the Dry Cabin Wildlife Emphasis Area, located in the northwest corner of the former Bear Valley ranger District.

There are also other Wildlife Emphasis Areas with non-scheduled harvest, and other areas such as the Wild and Scenic River Management areas which generally lack road systems, and would currently allow timber harvest only with helicopter-based logging systems. In addition to these areas, there are other timber stands in localized areas that cannot currently be economically harvested without either accessing through new road construction (most of the needed roads could be temporary roads), or using helicopter-based logging systems. Depending on the outcome of the Forest Plan Revision, the need for timber or other motorized access needs may change.

TM 2 and TM 3: How does the road system affect managing the suitable timber base and other lands? How does the road system affect access to timber stands needing silvicultural treatment?

This Forest-scale roads analysis was focused on the potential minimum primary road system. The existing arterial and collector road system is adequate for management of most suitable timberlands except as noted in TM 1. Many Forest collector roads are currently Operational Maintenance Level 2 roads and more roads that are currently OML 3 are likely to be changed to OML 2 in order to reduce maintenance costs.

Lands suitable for timber management in the Forest Plans were determined by:

1. Identifying all forested land from non-forested land.

2. Subtracting all non-forested land.

3. Subtracting forested land withdrawn from timber production: wilderness areas, research natural areas, wild and scenic river corridors, power line corridors, and administrative sites such as campgrounds.

4. Subtracting unsuitable forested land including lands where irreversible damage is likely to occur if managed for timber production, and land where restocking cannot be assured within five years.

5. Subtracting forested land where adequate response information is not available. These are areas where there wasn't enough information to predict response to timber management. These areas cannot be considered part of the suitable land base until further inventory is collected.

The results of those steps were used to identify the lands tentatively suitable for timber management. The last step in the suitability analysis was to determine the suitable land from the tentatively suitable land base. This step excluded the lands identified as not appropriate for timber production because they were assigned to other resource uses to meet forest plan objectives. The Malheur Forest Plan (Appendix B) identified 835,970 acres out of the 1,459,422 total Forest acres as suitable. The Ochoco Forest Plan (Appendix G) identified 533,180 acres out of the 844,640 total Forest acres as suitable.

The Allowable Sale Quantity was calculated from growth and yield projections based on suitable areas only. During the last 13 years of forest plan implementation, as the Forests conducted project level planning, ID teams have further refined the suitable timber base. Project-level ID teams have concluded that some stands in the suitable base are incompatible with management area prescriptions (they are too rocky, too wet, have unstable soils, etc.) and those acres have been removed from the suitable land. Another larger scale effort identified forested riparian areas as not suitable for timber management and those acres were removed from the suitable land base. As a part of the Malheur forest plan revision proceeds (including Ochoco lands administered by the Forest), the suitable timberland will be reanalyzed, and what was learned from project level analysis in the last 13 years will be used in the suitability analysis.

Timber management is generally economically feasible only if road access is present. Without an adequate road system, the Forest Plans management objectives and prescriptions for the suitable timber base and other commodity resources cannot be accomplished.

According to the Malheur Forest Plan (Chapter IV page 7), there were about 618 miles of new road construction projected during the first ten-year planning period (1990-1999). The activity schedules in Appendix A indicate an estimated 1320 miles or road reconstruction would be done through timber sales, and almost 260 miles of road reconstruction through Capital Investment funding for that same planning period.

According to the Ochoco Forest Plan Activity Schedule (Appendix A10-2), there were about 145 miles of new road construction and 200 miles of reconstruction would be done through timber sales activities during the first five years of the planning period (1990-1994). The activity schedule for Capital Investment funding (Appendix A11) indicates about 164 miles of road construction and reconstruction during the first ten-year planning period (1990-1999).

A major part of this planned road construction and reconstruction was to provide efficient access to suitable timberland. However, to date less than half of the planned road construction and reconstruction has been accomplished, as a result of a decline in both timber harvest and available Capital Improvement funding. Most of the new road construction planned consisted of local roads for timber access.

Most of this unroaded suitable timberland could be accessed through temporary road construction or by constructing local system roads. Temporary roads can also be utilized in many cases to reduce the density of permanent roads, and the associated maintenance

costs. This roads analysis did not attempt to assess the long-term need for temporary roads, as they are typically identified on a project basis to meet short-term needs.

The existing road system spacing and location is adequate to allow feasible harvest the majority of timber stands with either ground based or skyline logging systems except as noted in TM 1.

A detailed transportation system analysis for the unroaded portion of the Forest Plan suitable land was not undertaken, as a result of both time restrictions and because the suitable timberland could change soon with the Forest Plan revision. More detailed transportation system planning will need to be done during sub-forest and watershed scale analyses.

Management decisions on whether to provide access to unroaded portions of the suitable land will be made in the Forest Plan revision. The Forest Plan revision process will also inventory, evaluate, and make recommendations on how to manage inventoried roadless areas. A full range of management alternatives will be considered during the plan revision process.

Previous project scale roads analyses have also identified that the existing road system needs a number of other changes in order to allow more efficient access for timber management, particularly on local roads. This includes work needed on roads that have deteriorated significantly as a result of deferred maintenance, and changing the status of a few roads from decommissioned to closed (these roads were previously decommissioned without the benefit of a thorough interdisciplinary analysis to determine long term access needs of the area).

Minerals management (MM)

MM1: How does the road system affect access to locatable, leasable, and salable minerals?

The Forest Service administers its minerals program to:

1. Encourage and facilitate the orderly exploration, development, and production of mineral resources from National Forest System lands, and,

2. Ensure that exploration, development, and production of mineral resources are conducted in an environmentally sound manner and that these activities are integrated with planning and the management of other National Forest recourses. (FSM 2802).

Mineral resources are separated into three categories: locatable, leasable, and saleable.

Locatable Minerals are those deposits subject to location and development under the General Mining Law of 1872 (as amended). Forest Service authority is directed at the use of the surface of National Forest System lands in connection to the operations authorized under the United States mining laws (30 U.S.C 21-54), which confer a statutory right to enter upon the public lands to search for minerals. Forest Service regulations at 36 C.F.R. 228, Subpart A provide that operations shall minimize adverse environmental impacts to the surface resources, which includes the following"

- Using all practicable measures to maintain and protect wildlife habitat affected by an operation.
- Reclaiming surface disturbances, where practicable.
- Rehabilitating wildlife habitat.

The regulations require that roads needed for mineral activities shall be constructed and maintained to minimize or eliminate damage to resource values (including wildlife). Unless otherwise authorized, roads constructed solely for mining access that are no longer needed for mining operations shall be closed to normal traffic, bridges and culverts removed, the road surface shaped to as near a natural contour as practicable, and stabilized.

Much of the Malheur National Forest is open under the general mining laws in which the right of exclusive possession is vested in the discovery of a valuable mineral deposit. The existing road system has been sufficient to meet most locatable requests to date. Some areas of public lands located within the jurisdictional boundaries of the Malheur National Forest have been withdrawn from mineral entry through the Bureau of Land Management. This means mineral entry/activity of any sort are not allowed. These areas include, but are not limited to, Congressionally designated Wilderness areas, Research Natural Areas, National Recreation Areas, Administrative Sites, Special Interest Areas, etc. Locatable minerals are addressed in detail in the Malheur and Ochoco Forest Plans.

Access is allowed to people with mineral rights throughout the Forest and these routes may be closed to the general public. Access is addressed on an individual or case-by-case basis. The vast majority of any new roads constructed to access mining claims will be temporary. Where reconstruction/construction are necessary for access, bonding is required as part of an Operating Plan or Notice of Intent.

The amount of speculation, interest, and actual level of mining activity is dramatically influenced by the market values of locatable minerals, which are currently relatively low. The number of mining claims and related activities could increase very rapidly from the current level if market prices became significantly higher. As changes in market prices occur, it will change the demand for roaded access associated with mining operations. As

of February 2004 there were about 110 mining claims on the lands administered by the Malheur National Forest.

Leasable Minerals are federally owned fossil fuels (oil, gas, coal, oil shale, etc), geothermal resources, sulfur, phosphates, and uranium. These minerals are subject to exploration and development under leases, permits, or licenses issued by the Secretary of the Interior, with Forest Service consent. The 1920 Mineral Leasing Act (as amended) together with the 1989 Federal Onshore Oil and Gas Leasing Reform Act provide the authority and management direction for federal leasable minerals on National Forest System lands. In addition, mineral leasing on the Grasslands is authorized under the 1947 Mineral Leasing Act for Acquired Lands.

Withdrawals of unclassified lands from operations of the mineral leasing acts are requested only in exception situations. Classified lands, other than wilderness, which are not by law or otherwise withdrawn from operations under the mineral leasing acts include Wild and Scenic Rivers, National Recreation Areas, National Historic Sites, Natural Areas, and other specific classifications. In these areas, the Forest Service recommends leasing activities only when terms and conditions can be applied that will protect the purpose for which the lands were classified.

Road access for leasable minerals has not been and issue on either the Malheur or Ochoco National Forests. While there has been interest in mineral leases on some Forest Lands in the past, very little on-the-ground activity has occurred to date. Road access for leasable minerals is generally planned and developed on a case-by-case basis. Production of leasable minerals could require some high-standard haul roads, but site-specific transportation plans are generally developed as part of each leasable activity as needed.

Salable Minerals include mineral materials, otherwise known as “common varieties” which generally include deposits of sand, gravel, clay, rock or stone used for a number of purposes including road surfacing, construction materials, and landscaping. The disposal of these materials is through materials contracts or permits issued at the discretion of the Forest Service. All contracts contain requirements for reclaiming the sites, as much as practicable, to pre-mining conditions.

Existing Forest roads are generally sufficient to access salable minerals proposals. The value of salable common variety minerals is very sensitive to transportation costs. However, the Forest Service has total discretionary authority for disposal of common variety minerals and is not obligated by any statutory requirements.

The Forest Service has a network of developed rock materials sources on the Forest that are used primarily for surfacing and maintenance of Forest system roads. Some improvements to the existing access roads would be beneficial, but overall the access to these sources is adequate. Local Counties, agencies, and the Oregon State Highway Department frequently use materials from these sources for road projects, and they are also available to the public on a permit basis.

Range management (RM)

RM1: How does the road system affect access to range allotments?

The network of roads on the Malheur National Forest lands is perceived as having positive indirect effects (negative effects may exist but are unknown) on rangelands and positive direct effects on the administration of the grazing program. Until about the 1970s, the Forests had a number of livestock driveways, which were considered "sacrifice areas" in the range-management discipline (Stoddart and Smith 1955). Roads have replaced driveways as a means for transporting sheep and cattle to and from mountain allotments. As a result, most are grown in and no longer used, so the vegetative condition and overall health of these driveways has improved dramatically.

The road network on the Malheur National Forest has increased the administration capability of the range management program. Administratively, the road network now allows range conservationists to access allotments quickly by using vehicles rather than horses. Grazing permittees' have probably experienced lowered operating costs by having motorized access to allotments.

Essentially there is no scientific information for analyzing the effect of the existing Malheur National Forest road system on the range management program. Preliminary unpublished analyses from the Interior Columbia River Basin Ecosystem Management Project addressed the road issue from the perspective of ecological responses to the presence or absence of roads. The analyses found correlations between changes in vegetation composition, riparian functioning, and fire regimes and the presence of forest roads. The investigators could not conclude any cause-and-effect relations from these correlations, however. The study also found that higher road densities were associated with diminished ecological integrity, including those based on range criteria (Inland Columbia River Basin Project 2000).

Roads in National Forests are essential for administering the grazing program. Compliance enforcement was is also an activity that greatly benefits from forest roads. Roads also allow timely access to allotments. Most allotment planning incorporates Forest Service roads into their approved grazing system or as driveways to and from the allotment. Roads can reduce permittee operating costs by providing motorized access to allotments. If none of the National Forest roads were available for motorized access, permittee costs would increase substantially. These costs would accrue from increased riding time, cost of horses and riders, and added equipment costs (such as horse trailers).

In summary, the minimum primary road system is important for use and management of range allotments. There are other Level 2 (and possibly Level 1) roads that also provide access to allotments. Roads are also a very important component of the compliance and administration of the Forest's grazing program. Many questions remain, including the actual cost of any closures to permittees and the effects of any road closures to administering range management programs, including the weeds program, and compliance.

Water Production (WP)

WP1: How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes.

The existing road system is sufficient to access the few small water diversions, impoundments, and transmission pipelines located on NFS lands where the use is on adjacent private landowners. Some water developments are under permit and some pre-date the national forest requiring no authorization.

Across the Malheur Forest, there are portions of approximately 60 ditches and 20 domestic spring development/water transmission lines located on NFS lands that provide water for privately owned lands. The current road access is adequate for the permit holder to maintain the improvements. These roads are predominately maintenance Level 1 and 2 and open year-long. Public motorized access on a few roads is restricted on to use by the permit holder. The use by the permit holder of these roads is addressed with maintenance requirements in their permit.

Two small reservoirs are located on NFS lands, Canyon Meadows and Yellow Jacket. Canyon Meadows is located entirely on NFS lands at the head of Canyon Creek on the Blue Mountain District. There is a MOU between the Forest Service and ODFW to manage the facility. Adequate road access exists to the reservoir.

A small portion of the Yellow Jacket Lake development is located on NFS lands, Emigrant Ranger District. The spillway portion of the dam is under special use permit to ODFW. There is good access to the site.

There are far more water developments (100's) are identified as range improvements (i.e. ponds and spring developments/water troughs) that provide water for domestic livestock on NFS lands. The ponds are also used for road maintenance activities and fire suppression.

WP2: How does road development and use affect water quality in municipal watersheds?

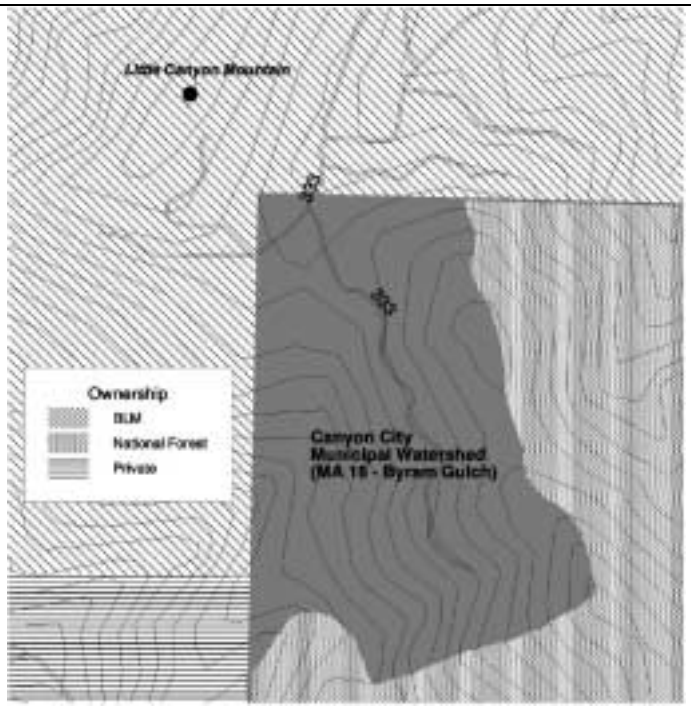
Figure 4– Byram Gulch

Byram Gulch

Identified in Malheur Forest Plan as Management 17; the area is under special use permit to the Town of Canyon City.

The special use permit has no specific use conditions other than maintaining high quality standards. The permit; expired 2001 and has been extended through 2002.

There are no current road use restrictions within the watershed.



Long Creek Mountain

Identified in the Malheur Forest Plan as Management 18; the area is under special use permit to the City of Long Creek.

The City of Long Creek has water a number of water developments under permit. The area is fenced with gated entry. The city is authorized to fence and gate the watershed area. They may use the existing roads to maintain their water developments. The permit expires 2004.

There is a year-long public CFR area and road closure to motorized vehicles.

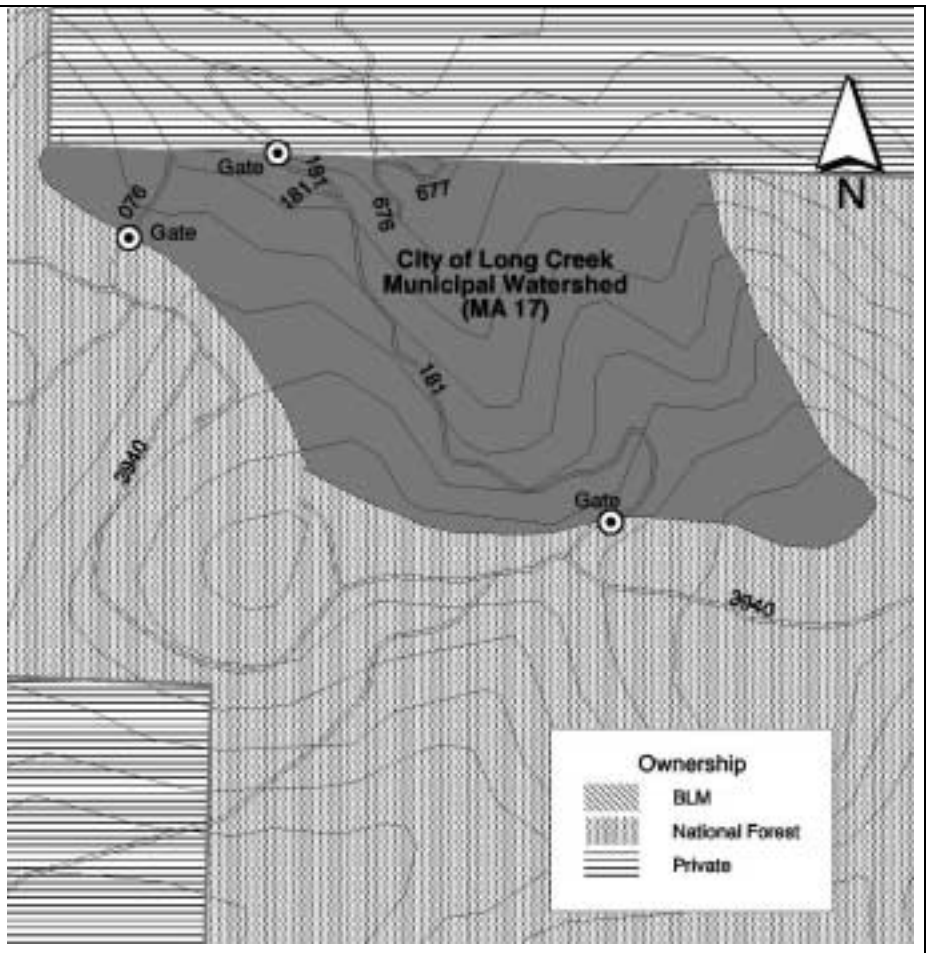


Figure 5-- Long Creek Mountain

WP3: How does the road system affect access to hydroelectric power generation?

There is currently one very small hydroelectric system providing power to one residence that is accessed by a closed level 1 road (FDR 7101877). The diversion and pipeline is located on Indian Creek that is within the Strawberry Creek Watershed. A special use permit currently authorizes this use.

Special Products (SP)

SP1: How does the road system affect access for collecting special forest products?

The current road system provides adequate access for collecting special forest products for personal use and commercial products. Special forest products include mushrooms, recreational rock collections, ferns, transplants, Christmas trees, firewood, and other products. As road closures, seasonal closures, or road decommissioning are considered during road analyses at the project or watershed scale, providing a reasonable level of motorized access for special forest products should be considered.

Any foreseeable changes in the Forest transportation system are expected to maintain adequate access for these types of activities. When roads are decommissioned or closed it reduces motorized access for some of these types of uses. But most of the roads that have been recommended for decommissioning in recent years were already closed, and many were located in RHCA areas, where firewood cutting and other harvests were already prohibited.

Special Use Permits (SU)

SU1: How does the road system affect managing special-use permit sites (concessionaires, communication sites, utility corridors, and so on??

The existing road system is sufficient to deal with almost all recreation and non-recreational special uses. Safe and efficient access to areas under Special Use Authorization has a direct effect on the economics of an operation, either thru volume of customers, or operation and maintenance costs. Most recreation special use proposals and authorizations are designed around the existing road system.

Access and Forest Service responsibility under R.S.2477 are discussed in the General Public Transportation (GT) report for this document. The Malheur National Forest has approximately 100 non-recreation Special Use Authorizations and less than 20 recreation Special Use Authorizations. The recreation authorizations are primarily temporary in nature and the number may vary from year to year. Most of the special use permits and authorizations rely on existing roads or utility corridors to access or accommodate construction, operation, and maintenance. These requests are analyzed through the NEPA process and are addressed in the associated decisions.

General Public Transportation (GT)

GT (1): How does the road system connect to public roads and provide primary access to communities?

National Forest system roads connect numerous public roads managed and operated by either the state of Oregon or county governments. A number of Forest roads serve as the primary through-routes that connect communities. Of greater importance is how the County roads and state highways give communities, tourists, and industries access to the National Forest. These roads connect to arterial, collector, and some local roads at the Forest boundary where traffic is dispersed into the Forest for a variety of uses. Virtually all of the local Forest roads connect to Forest collector and arterial roads, or directly to County roads, State and Federal Highways. Some Federal and State Highways and County roads traverse into or through the National Forest. The following table lists public roads identified as important to linking the National Forest to public roads and local communities.

Table A – Public Roads under County or State jurisdiction that access the National Forests

Public Road Number	Jurisdiction
CO 10200	Harney County
CO 12700	Harney County
CO 13800	Harney County
CO 18000	Grant County
CO 20000	Grant County
CO 20A00	Grant County
CO 25000	Grant County
CO 26000	Grant County
CO 28000	Grant County
CO 30400	Harney County
CO 30600	Harney County
CO 32000	Grant County
CO 33000	Grant County
CO 34000	Grant County
CO 35000	Grant County
CO 43000	Grant County
CO 48000	Grant County
CO 49000	Grant County
CO 54000	Grant County
CO 55000	Grant County
CO 58000	Grant County
CO 60000	Grant County
CO 62000	Grant County

Public Road Number	Jurisdiction
CO 63000	Grant County
CO 63C00	Grant County
CO 64000	Grant County
CO 65000	Grant County
CO 68000	Grant County
CO 69000	Grant County
CO 71000	Grant County
CO 73000	Harney County
CO 88000	Grant County
CO 112	Crook County
CO 318	Crook County
CO 90000	Grant County
OR 19	Oregon Dept. of Transp.
OR 207	Oregon Dept. of Transp.
OR 245	Oregon Dept. of Transp.
OR 402	Oregon Dept. of Transp.
OR 7	Oregon Dept. of Transp.
US 20	Oregon Dept. of Transp.
US 26	Oregon Dept. of Transp.
US 395	Oregon Dept. of Transp.

These roads and others are important to and used by smaller communities around the Forest Lands. Many people in these communities rely on access to the Forest for their livelihood as well as for recreation. The Forest is important for mining, timber, ranching, tourism and recreation. Some of these communities are listed in the following table.

Appendix C TBL 2-- Small residential communities near Lands administered by the Malheur National Forest

GRANT COUNTY	Austin, Canyon City, Dayville, Fox, Galena, Izee, John Day, Long Creek, Monument, Prairie City, Seneca, Silvies
HARNEY COUNTY	Burns, Drewsey, Hines
BAKER COUNTY	Granite, Greenhorn, Unity, Whitney

GT (2): How does the road system connect large blocks of land in other ownership to public roads?

The amount and dispersion of private and other ownership lands vary across the lands administered by the Malheur National Forest. The majority of other ownership lands within and adjacent to the analysis area are accessed through Federal and State Highways and County roads that connect to Forest roads. Forest arterial and collector roads currently provide access to most of these lands. However, some are accessible only by

local roads and some have no roaded access, such as those in roadless areas or wilderness areas.

Access needs to in-holdings are addressed on an individual basis as requests are received. Forest Service policy is that access will be provided to a level that is reasonable and suitable for the uses occurring on the land. When landowners desire access, they are asked to apply for a special use or road use permit. The application is then analyzed through the NEPA process to determine possible environmental effects and the level of reasonable access required. Access to in-holdings by roads under Forest jurisdiction is normally limited to summer or non-snow periods, but in some cases, permits are issued for snow plowing during the winter.

Responsibilities for road improvements and maintenance are normally determined through a commensurate share process. If access is being provided by a public road agency such as the county or state, then the Forest Service may not be obligated to provide any additional access through federal lands. When larger developments or subdivisions occur and in-holding traffic is expected to exceed that generated by the users of the National Forest, agency policy is to pursue turning jurisdiction of the Forest road over to another public road authority such as the county or state.

Public Forest Service Roads

The Forest Service has identified a portion of its road system for designation as public forest service roads under the proposed Public Forest Service Roads program. These roads will be open and available to the traveling public on a regular and consistent basis. Public Forest Service roads will be maintained for passenger car access and provide unrestricted access to and through the National Forest, except when there are seasonal snow closures, emergency closures, or scheduled closures such as for wildlife. More information about potential PFSR roads is found in Chapter 2 of the Forest-scale Roads Analysis report.

GT (3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS2477, cost share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)

Revised Statute (RS) 2477

Section 8 of the Act of July 26, 1866, 14 Stat. 253, Revised Statue 2477, 43 U.S.C. 932, repealed by the Act of October 21, 1976, (Federal Lands and Policy Management Act, FLPMA) and 90 Stat. 2793, (RS 2477), provided:

“The right of way for construction of highways over public lands, not reserved for public uses, is hereby granted.”

The Statute was repealed by FLPMA, in 1976, but valid rights established under RS 2477 prior to 1976 were not affected by the repeal.

To determine whether a valid RS 2477 highway exists, several elements must be met, as provided by the Statute:

- The lands were public, not reserved for public uses, at the time of construction.
- There had to have been some form of construction of the highway.
- The highway so constructed must be considered a public highway.

Creation of the Forest Reserves generally occurred between 1891 and the early 1900's. Any highway had to be constructed prior to reservation in order to be considered under this Act. Since the assertion is a claim of title against the Federal Government, an RS 2477 claim must be asserted by a public road agency.

The January 1997, Interior Interim policy and companion September 1997, Forest Service (FS) policy which directed deferring any processing of RS 2477 assertions except in cases where there is a demonstrated, compelling, and immediate need has not been revisited by either Agency. This policy was issued in light of pending legislation proposed by the Clinton Administration that was to establish a uniform administrative process to address RS 2477 assertions. Congress did not subsequently address the proposed legislation.

In October 1996, various environmental organizations sued several Utah counties and the Bureau of Land Management (BLM) to bar further road construction by the counties over BLM lands. On June 25, 2001, the U.S. District Court for the District of Utah ruled against the counties in favor of the Federal government. The decision was appealed. In 2003, the Department of Interior entered into a Memorandum of Understanding (MOU) with the state of Utah under a settlement agreement for this case. The establishment of this MOU has led to much discussion about process for acknowledgement of assertions and establishment of policy for both the BLM and the FS, but no further action has been taken to lift the moratorium by the Secretaries of Interior or Agriculture.

RS2477 does also apply to private land if these conditions were met prior to patent.

Under the current moratorium, the FS urges counties and states to work with the FS to authorize use of the roads, individually, and define scope and responsibilities under current authorities of the Forest Roads and Trails Act and FLPMA.

Numerous roads crossing the National Forest fall under the jurisdiction of agencies other than the Forest Service. When desirable, cooperative agreements should be established to share road improvement and maintenance responsibilities when all partners can benefit. The Forest Service, Federal Highway Administration/Oregon Department of Transportation and Grant County have entered into such agreements.

Easements and Agreements Federal and State Highways

The Federal Highway Administration/Oregon Department of Transportations easement or agreements are listed in the following table:

Appendix C TBL 3-- Easements and Agreements for Forest Highways on the Malheur National Forest

Route No./Name	Description	County
OR Hwy 7 - Whitney Highway	Easement/ODOT	Grant
OR Hwy 7 – Whitney Highway	Easement/ODOT	Grant
US Hwy 26 - Blue Mountain Summit to Austin Junction	Easement pending/ODOT	Grant
US Hwy 26 - Dixie Summit to Austin Junction	Easement/ODOT	Grant
US Hwy 26 - NFS boundary to Dixie Summit	Easement/ODOT	Grant
US Hwy 395 - N Fox Valley to Long Cr Valley	Easement/ODOT	Grant
US Hwy 395 – S Fox Valley to Beech Cr.	MOU/ODOT	Grant
US Hwy 395 - South of Canyon Creek through NFS lands	MOU/ODOT	Grant and Harney

Long term, all the US Highways will have easements. During major construction or reconstruction projects that are financed by Federal Highway Administration, easements will be prepared with the Forest Service and given to ODOT. Currently, a Memorandum of Understanding (MOU) between ODOT and the Forest Service is in effect (February 1993) that covers those portions of the highway that does not have an easement.

At present, there is one formal agreement between the Malheur National Forest and one of the Oregon counties to share in road operations or maintenance. A Forest Development Road Agreement between the USDA Forest Service and Grand County, Oregon (11/19/90) was signed on 11/19/00 and revised on 09/14/95 and then supplemented 05/22/00. This agreement identifies Grant County maintenance responsibilities on 37 different roads and includes maintenance level 3, 4, and 5 roads. The roads provide access to and within NFS lands (see attached map).

There are no cost-share agreements with private or public landowners on the Forest. The diversity of ownership and lack of any sizable in-holdings does not indicate a need to pursue agreements of this type. However, the Grant County agreement identifies joint reconstruction projects – not sure if this is consider a cost-share agreement.

Rights of access by law, reciprocal rights, or easements are recorded in Forest files and county courthouse documents. The Forest recognizes these rights and works with the owners to preserve access while protecting the natural resources and facilities on adjacent National Forest Lands. There is also an understanding by the Forest Service that

individuals or entities may have established valid rights, unknown to the Forest Service at this time, to occupy and use National Forest lands and roads. The courts have established that such valid outstanding rights may be subject to some federal regulation. See *Sierra Club v. Hodel, 848 F 2d. 1068 (10th Circuit, 1988).* This analysis recognizes that such valid outstanding rights may exist and the Forest Service will certainly honor such rights when it is subsequently determined that the specific facts surrounding any claim to such rights meet the criteria set forth in any respective statute granting such occupancy and use (see Washington County v. The United States, 903 F. Supp. 40 [D. Utah, 1955]).

Numerous roads crossing the National Forest fall under the jurisdiction of agencies other than the Forest Service. When desirable, cooperative agreements should be established to share road improvement and maintenance responsibilities when all partners can benefit.

Federally Designated Forest Highways

The Forest Service, Federal Highway Administration and the Oregon Department of Transportation signed a Memorandum of Understanding (MOU) in 1997. This document set forth general procedures for planning, programming, environmental studies, design, construction and maintenance of designated Forest Highways. The Forest Highways currently designated by the Federal Highway Administration are listed in the following table:

Appendix C TBL 4- Federally Designated Forest Highways

Forest Highway Route No. & Name	Description	County
FH 33 Pendleton-John Day (US 395)	From jct. with Grant County Rd. 20 (Middle Fork John Day River Road) northerly to the Grant-Umatilla County Line and northerly to a jct. with Umatilla County Rd. 1417 approx. 8 miles north of Ukiah.	Grant Umatilla
FH 34 Pendleton-John Day (South-Section - US 395)	From Jct. with Grant County Rd. 20 (FH115) southerly to a jct. with US 26 (FH 36) in John Day	Grant
FH 35 Burns-John Day (US 395)	From jct. With Forest Road 47 east and north to jct. With US 26.	Harney Grant
FH 36 John Day (US 26)	From jct. With Fields Creek Road (Forest Road 21) east to Grant/Baker County Line and further east to Jct. with Forest Rd. 16.	Grant Baker

Forest Highway Route No. & Name	Description	County
FH 115 Middle Fork John Day (Grant County Road 20)	From jct. With US 395 approx. 13 miles north of Long Creek southeasterly to jct. With SR 7.	Grant
FH 116 Keeney Fork Road (Grant County Road 18)	From jct. With US 395 at Long Creek easterly on County Rd. 18, southeasterly and southerly on County Rd. 18 to jct. With US 26.	Grant
FH 117 Pleasant Hill Road (Grant County Road 49)	From jct. With US 26 approx. 2 miles east of Mount Vernon southerly to a jct. With Forest Rd. 49	Grant
FH 118 Logan Valley Road (Grant County Road 62)	From city limits on east side of Prairie City southeasterly to a jct. with Forest Rd. 16 at Summit Prairie	Grant
FH 119 Canyon Creek Road (Grant County Road 65)	From jct. With US 395 approx. 11 miles south of John Day southeasterly to the Malheur N.F. boundary.	Grant
FH 120 Prineville Logdell Highway (State Highway 380, Crook County Road 112, and Grant County Roads 63 and 67)	From jct. With US 26 southeast and east to Crook-Grant County line east and northeast to jct. With US 395	Grant Crook
FH 121 Burns-Izee (North Section – Grant County Road 68)	From a jct. With County Rd. 63 approx. 2 miles southeast of Izee southerly to the north boundary of the Malheur N. F.	Grant
FH 122 Weberg Road (Crook County Road 318 and Grant County Road 69)	From jct. With County Rd. 63 approx. 1 mile west of the Crook-Grant County Line south easterly to the jct. with Forest road 41.	Grant Crook

Forest Highway Route No. & Name	Description	County
FH 126 Burns-Izee Rd. (South Section – Harney County Road 127)	From jct. With US 395 approx. 1 mile south of Hines westerly then northerly to south boundary of the Malheur N. F. near the Campbell Ranch.	Harney
FH 127 Fort Harney Road (Harney County Road 102)	From jct. With US 20 approx. 13 miles east of Burns northerly to a jct. with FR 28 near Fort Harney Site.	Harney
FH 128 Pine Creek Road (Harney County Road 306)	From jct. With US 20, 27 miles east of Burns north and northwesterly to the south boundary of MNF north of Van.	Harney
FH 148 Whitney-Tipton (State Highway 7)	From jct. with US 26 at Austin Junction northeasterly to Grant-Baker County Line. Continues easterly and northerly into Baker County.	Grant Baker
FH 150 Silver Creek (Harney County Road 138)	From Jct. With US 20 approx. 2 miles west of Riley, northerly and northwesterly to jct. With Forest Road 45	Harney
FH 235 Burns Drewsey Road (US 20)	From Jct. with US 395 easterly to Jct. with Drewsey Road	Harney

GT (4): How does the road system address the safety of road users?

Use of Forest Roads for logging activities has declined significantly compared to historic levels, but the Forest is experiencing moderate increases in overall recreational use. As open road densities continue to decline as a result of additional road closures and decommissioning of roads that are no longer needed, heavier use can be expected on the roads that do remain open. Traffic conflicts could increase with future increases in population, tourist visits, and recreational use in the analysis area. Increased maintenance or other road improvements may be necessary to safely accommodate increased traffic levels on roads that remain open in the future.

In 1975, the Forest Service developed a Memorandum of Understanding with the Federal Highway Administration that required the Forest Service to apply the requirements of the

national highway safety program, established by the Highway Safety Act, to all roads open to public travel. In 1982, this agreement was modified to define "open to public travel" as "those roads passable by four-wheeled standard passenger cars and open to general public use without restrictive gates, prohibitive signs…". Most roads with an operational maintenance level of 3, 4, and 5 meet this definition. Design, maintenance, and traffic control on these roads emphasizes user safety and economic efficiency.

Approximately 80% of the road maintenance and improvement funds allocated to the Forest are typically used on these higher standard roads. Safety work such as surface maintenance, clearing debris from the roadway, and installation and maintenance of warning and regulatory signs are performed on an annual basis. During the winter, these roads are not normally plowed open and some are subject to seasonal restrictions to prevent road damage during the early spring when the roads are drying out. Traffic control signing follows standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD).

When accidents occur on Forest roads, often the Forest Service is not immediately informed unless an employee is involved. Accidents involving only public motorists are reported to the local sheriff or state patrol, if reported at all. When the Forest does become aware of an accident, an investigation is initiated to attempt to identify the cause. If a feature of the road is found to be unsafe, addressing the condition becomes a high priority. The Highway Safety Act (FSM 7701.3) and requires a program for identifying accident locations and for maintaining surveillance of those locations. There does not appear to be a consistent or formal program on the Forest to address this requirement at present, and the Forest needs to address this concern.

Road condition surveys conducted in recent years have revealed a significant backlog of deferred maintenance items on existing level 3-5 roads, some of which are considered critical maintenance items. These items include aggregate placement, turnout construction or reconstruction, brushing and clearing for sight distance and signing. A large portion of this backlog is a result of deteriorated road surface on both aggregate-surfaced and paved roads. In the past, road-resurfacing projects were planned as part of commercial timber sale activities. Declines in timber harvest activities have reduced the Forest's ability to fund this work.

Some arterial and collector roads (or segments of them) do not meet standards for alignment or roadbed width. Built originally for commercial use, design considerations did not emphasize the higher volumes of public recreational traffic that the roads are experiencing today. Many roads are lacking sight distance, turnouts, and adequate lane width needed for the traffic speeds that are now occurring. Another high-cost item is roadside brushing. Level 3, 4, and 5 roads need to be placed on a recurring schedule to maintain sight distance and a safe clear zone. While this work has been part of the annual maintenance program, it has often been deferred in years when budget allocations are down. Finally, warning and regulatory signing contributes significantly to the backlog. As funding levels permit, these signs are being installed and maintained. Forest expenditures for signing have averaged about $45,000 annually in recent years, and

approximately 80 percent is used for signing OML 3, 4, and 5 roads "encourage" OML 2 roads.

Maintenance level 1 and 2 roads that intersect the higher standard roads need to be clearly distinguishable from those that are managed for passenger car use. This can be accomplished in a variety of ways. Generally, the surface type and condition of the lower standard road should convey the impression that a high clearance vehicle is needed. The carsonite post used to identify the road should also be shaped so the number is vertically aligned and not of the distinctive or rectangular shaped signs used on level 3, 4, and 5 roads. If the road is not a through road, then the carsonite post should be installed perpendicular to the main road. The closure device on roads that are maintained at level 1 should be visible from the intersection or have a clear warning sign for traffic approaching the closure. During watershed and project-scale analysis, Forest officials should give high priority to recommending either improving or decommissioning roads that pose the greatest risk to user safety and or resource concerns.

Travel management regulations are posted on the ground and described on the Forest Visitor's map. These regulations have been established by the Forest to enable safe motorized travel while protecting natural resources and minimizing conflicts between users. Off-road recreational vehicles such as trail motorcycles and ATVs (all terrain vehicles) are prohibited on some Forest roads. For example, on the Malheur, ATVs are not allowed on paved roads; two-lane gravel roads; or any road that is posted with as prohibiting ATV use (red slash/ATV signs). Oregon State Statute 821.020 establishes the areas where exemptions from equipment requirements for off-road vehicles are applicable.

Administrative Use (AU)

AU1: How does the road system affect access needed for research, inventory, and monitoring?

The Malheur Forest Plan lists Research Natural Areas (RNAs) as Management Area 9, and the Ochoco Forest Plan RNA's are listed as Management Area MA-F5. The plan's standards and guidelines allow road construction in RNAs only if they are needed for research purposes or to meet RNA objectives. Wildfires threatening RNA's are generally suppressed as quickly as possible; on the Malheur wildfires can be allowed to burn if it has been pre-determined that doing so is beneficial and the fire is within planned prescriptions. Prescribed fires are allowed only if needed to perpetuate the vegetation for which the RNA was established or proposed. The Malheur Forest Plan allows action against endemic or epidemic levels of insects or diseases if it is in accordance with the direction given in the establishment report for the RNA. The Ochoco Forest Plan specifies that no action will be taken unless an outbreak will drastically alter the natural processes with the RNA.

The Malheur Forest Plan identified one existing Research Natural Area (Canyon Creek), and four proposed RNAs (Dixie Butte, Baldy Mountain, Dugout Creek, and Shaketable). The Canyon Creek and Baldy Mountain areas are both located within the Strawberry Wilderness Area. The Shaketable area is located within the Shaketable Semi-Primitive Non-Motorized area. The proposed Dixie Butte RNA is located near the top of Dixie Butte. Dugout Creek is located near the North Fork Malheur River campground. The Ochoco Forest Plan identified four existing RNA's, three of which are on lands now administered by the Malheur. Those three include the Dry Mountain, Silver Creek, and Stinger Creek RNAs.

The existing Forest road system provides adequate access to the designated RNA's, where roaded access is appropriate.

The Malheur Forest Plan identified five areas to be managed as Special Interest Areas (SIAs – Management Area 8). There are no SIAs identified on Ochoco lands administered by the Malheur:

- Malheur National Forest – Cedar Grove Botanical Area
- Malheur National Forest – Magone Lake Geological Area
- Malheur National Forest – Tex Bridge Geological Area
- Malheur National Forest – Fergy Spruce Grove
- Malheur National Forest – Sumpter Valley Railroad

This prescription is similar to MA 9 and MF-5A in that management emphasizes unusual scenic, historical, geological, botanical, zoological, paleontological, or other special characteristics. All of these designated areas have adequate roads to bring scientists, interested observers, and monitoring personnel into the areas.

The Malheur National Forest Plan revision effort has just begun in 2004. The Forest Plan revision will also cover the Ochoco National Forest lands currently administered by the Malheur. The revision process may identify additional RNAs and SIAs. If any new areas are designated, a road system that provides adequate access for research, inventory, and monitoring will need to be evaluated and developed as needed.

AU2: How does the road system affect investigative or enforcement activities?

The potential minimum primary road system on the Forests generally provides good access for investigative and enforcement activities.

The Malheur National Forest road system facilitates, either directly or indirectly, most criminal activity occurring on national forest lands. Virtually all forest crimes are committed in conjunction with a vehicle that has accessed the Forest using system roads. The large Forest road system provides egress at many different locations making it difficult for law enforcement personnel to intercept violators. The road system inside the Forest is diverse and wide ranging. This allows those searching for illegal forest products

a large area in which to operate. It also serves to make apprehending such violators extremely challenging.

The road system itself impacts law enforcement in activities several different ways. Providing safety for the users of the road system has become an emphasis over the past few years. The Forest road system has experienced an increase in accidents and incidents of careless operation. Forest Service law enforcement personnel have had to deal increasingly with traffic related issues such as suspended drivers and excessive speed. In addition, Law Enforcement Officers have had to investigate numerous traffic accidents, some of which have resulted in citations. These cases often have resulted in litigation and the need to respond to FOIA requests from those involved.

Because of road density issues and the need to protect threatened and endangered species, the Malheur National Forest has closed a large number of roads to motorized use. These closures include both permanent and seasonal restrictions. Forest terrain often makes skirting closure devises easy, resulting in a significant number of violations. Law enforcement personnel spend a considerable portion of their time investigating and patrolling for such violations, especially in hunting season. Officers also investigate numerous instances of vandalism to closure devices and signs.

ATV use has increased dramatically on the Forest during recent years. Many roads are closed to ATV use, which has impacted enforcement activities. In addition, a portion of the forest is closed to off road motorized travel either by special order or wilderness designation. Violators have been numerous and difficult to apprehend. The extensive road system provides ATV's a myriad of opportunities from which to travel off road in violation of these restrictions.

There are increasing incidences of minors in possession of alcohol and illegal drugs on the Forest. Much of this activity is in the form of evening partying, which often occurs near local towns adjacent to the potential minimum primary road system. These gatherings often result in resource damage and property vandalism.

Protection (PT)

PT1: How does the road system affect fuels management?

Fuels management objectives for the Forests are addressed in the Forest Plans. However, for this roads analysis, a background on the forest vegetation and fire return intervals is appropriate for responding to this question.

Forest vegetation types on the Malheur National Forest include cold, moist, lodgepole pine, dry and woodland types. Generally, woodland and dry types occur at lower

elevations or on south slopes at higher elevations. Moist forest types occur more generally in the portions of the Forest with northerly aspects, and the cold forest types are most common in areas with northern aspects, in drainages, and at higher elevations.

Woodland forest types were historically open savannahs, containing open stands of juniper and ponderosa pine. Over time, as a result of fire exclusion, most of these areas have evolved into dense stands of ponderosa pine and juniper.

Dry forest types historically had multiple-aged ponderosa pine stands with limited under-story because the short fire intervals of 20 to 50 years with low intensity fires burned out the under-story vegetation and accumulated ground fuels. Over the past 80 years, fire suppression in this vegetation type has resulted in heavy accumulations of dead fuels and fire ladder under-story growth in many areas of the Forest. During the last 50 years, as fuels have built up, wildfires in these stands have become more intense and larger in scale, resulting stand-replacing fires.

Lodgepole pine occurs in dry, moist, and cold forest types, as even-aged stands with moderate to long fire intervals of 100 to 200 years and historic high-intensity, stand-replacing fires. As these stands age, they build dead fuel litter from the dead and dying trees within the stand. Often an under-story of shade-tolerant grand fir will develop, adding ladder fuels which increase potential fire intensity. During the past 90 to 120 years, stand replacement fires burned much of the lodgepole pine on the Forest.

Cold forest types have stands that are mostly comprised of multiple-ages of Englemann spruce and sub-alpine fir. These stands experience long fire intervals of up to 500 years, with high-intensity, stand-replacing fires. Fire suppression activities during the past 80 years have not had much affect on this forest vegetation type due to the long fire intervals. These stands also occur in cooler and wetter growing sites so prolonged, dry weather conditions are necessary for these stands to be susceptible to stand-replacing fires.

Overall, outside of the Wilderness Areas and Inventoried Roadless Areas, the existing Malheur National Forest road system provides good access for fuels management. But there are some local Forest areas where the majority of local roads have native surfaces that are often deeply rutted, brushed in, narrow, or otherwise in poor condition. The poor condition of roads in these types of areas may make it relatively dangerous to conduct prescribed burning in those areas.
Many areas requiring fuels treatments need to have the fuels reduced through mechanical methods before prescribed burning. Mechanical fuels treatments are dependent on existing road access, and mechanical treatment of fuels involving removing excess fuels either by timber sales or service contracts are also limited in the areas with poor road conditions.

The Forest has recently initiated several major fuel reduction projects, and more projects are likely during the next several years. The focus of much of this fuel reduction planning is the urban interface, particularly the issue of public safety in these areas. Urban interface areas consist of summer cabins and year-round homes, and they

generally have an adequate road access system for fuels management projects, including commercial harvest to meet fuel reduction objectives.
After fuel reduction has been accomplished in the urban interface areas, the next priority areas for fuels reduction projects are likely to be areas with good road access, and especially those areas where there have been previous vegetation management activities. These are the areas that could be most economically treated and also where human cause fires are more likely to occur.

The lowest priority for fuels reduction projects are probably unroaded areas or areas with poor road access. Fuel reduction treatments in these areas would be costly even if new roads were constructed. Multiple resource impacts such as potential for stream sedimentation would have to be analyzed. Opposition from some portions of the public would make fuel reduction project planning prolonged and expensive.

There are have been no plans completed to date for fuel reduction projects in unroaded areas, though some are currently under development. If commercial harvest is considered as a fuel reduction tool in currently unroaded, potential minimum primary road system identified with this analysis is not adequate for accomplishing anticipated fuels management activities in some areas.

PT2: How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

The firefighting organizations fielded by responsible agencies and entities comprises a broad mix of aerial and ground resources. The foundation for delivering firefighters and resources is provided by the network of roads, created for and funded by other purposes. Fire management budget, organization, staffing, and resource placement are largely determined in the context of the existing transportation system. National Fire Management Analysis System (NFMAS), is used for Fire planning. It blends actual fire history, suppression policy, firefighter unit productions rates, cost, and net value change (the positive and negative effects of fires of various intensities, expressed in dollars) into an economic efficiency model, the output of which is a description of the optimum fire organization for the unit. This optimum organization (most efficient level, or MEL) is one that minimizes the sum of the funded fire organization, suppression costs, and net value change. Funding appropriated for fire preparedness and pre-suppression is directly connected to the outputs of this planning process and is predicated on the access provided by the existing road system. If any sizable reductions of the road system are planned, it should prompt a re-analysis of MEL.

To a large extent, the existing road system has molded the intensity and extent of fire suppression activity, and the agencies ability to fight fires has grown during this century along with the expanding network of roads. In fact, the availability and location of roads does affect the approaches to fire suppression, with mixed effects, so that fires in road-accessible areas have been more intensively managed than those in more remote locations.

In areas with no roads, or areas with poor roaded access, fires can be staffed with smoke jumpers or helicopter rappelling crews, provided they are available and use of helicopters and airplanes can be utilized to drop water or retardant. However, if extended attack is needed or if project fires occur in these areas, it is difficult to staff the fires and bring in equipment. The result is a reduced capacity to suppress the fires and larger fires may be the result.

Overall, outside of the Wilderness Areas and Inventoried Roadless Areas, the existing road system on Forest Lands administered by the Malheur provides good access for fire suppression in most areas. However in addition to the areas with inadequate access noted in TM 1, there remain some areas where the majority of local roads have native surfaces that are often deeply rutted, brushed in, narrow, or otherwise in poor condition. This road situation makes access for wildfire suppression more difficult and generally makes the response time slower. Difficult access and slow response time combined with the high wildfire frequency, heavy fuel loading, and growth in the urban interface is increasing the risk to humans and resources from catastrophic wildfires.

Roads have also proved useful during actual fire suppression, limiting fire spread under low and moderate conditions. However, the more intense, rapidly spreading fires, or those accompanied by spotting are usually beyond the capacity of roads to check. Roads have often been used as foundations for fuel-breaks and have some value in isolating and breaking up the continuity of fuel-beds in many cases. Some roads are more useful than others for fire suppression. For example, ridge-top roads tend to be most useful for firebreaks and defensible fire-lines while mid-slope roads often have the least value. Road location and slope position, relative to fuel hazards and values at risk, could be used as the basis for assigning incremental values to specific roads for fire suppression.

The effects of organized and effective suppression (initial attack is successful in 97 percent of wild-land fire ignitions) on fire regimes are widely acknowledged, particularly where the amounts of available fuel have significantly increased over historic amounts, and where fuels that now occupy extensive contiguous tracts of land support larger and more intense fires. Partly in recognition of this trend, the new national wild-land fire policy aims to substantially increase the number of acres where fuels are managed and wildland fire is used to restore ecosystems and to reduce undesirable fire effects and suppression costs.

The need for access to conduct these management activities tends to favor maintaining a maximum network of roads, but the associated costs of doing so as a specific and attendant project expense have not been assessed. As efforts to reduce available road networks continue, those responsible for fire and fuel management are expected to favor gating and placing barriers on road segments rather than decommissioning.
Historically, some private land owners have allowed the Forest Service unrestricted access to NFS lands to suppress wildfires and perform other land management projects. The Forest sometimes acquired temporary administrative access through the private lands to accomplish project work, such as forest health and fuel treatments. But opportunities to secure unrestricted, permanent access are not always realized. Increasingly, on roads where the Forest Service does not have legal rights-of-way through private lands, private

landowners are installing locked gates on the roads that pass thorough those private lands. Often these landowners must be contacted before the wildland firefighters are allowed to pass through these locked gates. This situation is slowing the Forest's response time.

The project-scale roads analysis requirements for road-related projects present an opportunity for the Forest to consistently address acquisition of necessary access through private lands for roads where the Forest Service needs access for long-term land management activities.

In areas where new road access is created, some increase in the number of human-caused fires is expected. This does not seriously affect the wildfire situation on the Forest, since access is usually conducive to rapid initial attack and suppression and roads often provide good firebreaks.

Question **EF-4** includes detailed descriptions, tables and graphs of historic fire occurrence on lands administered by the Malheur National Forest.

PT3: How does the road system affect risk to firefighters and to public safety?

Depending on the road system, there may be an increased risk to firefighters and to public safety. The longer it takes firefighters to respond to a reported fire, the greater the chances that fire will become larger and more difficult to suppress. The potential for catastrophic wildfires in areas with limited access is increasing; these catastrophic fires are more dangerous to firefighters, pose greater potential risk to public safety, and are more likely to cause structure losses.

The greatest fire public safety concern associated with road access is at the interface of urban and Forest lands. Private Inclusions and Wildland Urban Interface Areas within and around the forest affect about 35% - 45% of the forest. Wildland Urban Interface Areas within the forest boundary or next to the boundary include Galena, Austin, and Seneca. Other Communities near by include Canyon City, Dayville, Fox, Greenhorn, Hamilton, Izee, John Day, Long Creek, Mount Vernon, and Prairie City. There are many Private Inclusions throughout the Forest.

Homeowners sometimes build access roads that will not accommodate large emergency vehicles. Forest Service firefighters must sometimes attempt to protect privately owned structures from wildfire without the benefit of reasonable access.

PT4: How does the road system contribute to airborne dust emission resulting in reduced visibility and human health concerns?

Air quality impacts from the Forest road system are associated with vehicle emissions and dust from traffic on unpaved roads. These effects typically are localized and temporary, and their extent depends on the amount of traffic. Dust from unpaved roads increases with dryness as well as vehicle weight. Most Forest roads are unpaved, and are

used for recreational purposes and resource management purposes related to timber harvest, mining, and other uses.

Motorized recreation occurs year-round. Summer use includes off-highway, two-wheel and four-wheel drive vehicles. When these vehicles travel on unpaved surfaces dust is created, but this is generally not an issue except for short periods in localized areas, such as where intensive management activities are taking place. Vehicular travel on unpaved roads can be expected to be heavy during resource management activities such as timber harvest, but these uses typically require dust abatement measures to reduce the air quality impacts of sustained and heavy traffic use when deemed necessary. As use of Forest roads increases with recreation or other uses occurs, road dust impacts to sensitive areas may need to be addressed.

Dust abatement can be a relatively expensive activity, and is dependent on budget levels and priorities. The Forest has applied dust abatement products on one Forest road that receives a high level of public use a few times in the past when funds were available. But funding is unlikely to be available to do this again in the near future.

Dust abatement should be considered as a mitigation measure for higher traffic volumes resulting from commercial activities and special use permits, particularly on arterials and major collectors and when traffic is expected near developed recreation sites. Other mitigation measures can be used, such as reducing speeds, watering, and limiting the number of trips per day and the time of day for operations.

On un-surfaced roads or native surfaced roads, temporary increases in dust emissions can also occur during and after routine surface maintenance when conditions are dry. Watering during blading or scheduling maintenance when natural moisture content is higher helps reduce overall dust emissions.

Recreation (UR, RR)

UR1, RR1: Is there now or will there be in the future excess supply or demand for roaded or unroaded recreation opportunities?

To evaluate the unroaded and roaded recreation opportunities we looked at the Recreation Opportunity Spectrum (ROS) for the Forest. The ROS describes the condition of the land relative to the needs of recreationists.

Recreation Opportunity Spectrum (ROS)

The ROS is used to describe the recreation opportunities available on the landscape. It defines recreation areas based on different settings that provide different experiences. The presence of roads and the distance from roads are two criteria for determining the ROS class of an area. The mix of ROS classes on the Malheur National Forest does not

include urban opportunities. Approximately 84 percent of the Forest is considered to be roaded, but not all roads are available for recreation since some roads are open to administrative and other use by permit only. Approximately 38 percent of the Forest is in a Roaded Modified (RM) class. RM areas are not managed for recreation but are heavily managed for other activities, usually timber harvesting. One result of past timber harvesting includes an increase in road miles available for recreationists. The current practice is to close all newly constructed roads after the timber sale activities are completed. If this practice is continued, after several years the harvest areas may provide semi-primitive recreation opportunities if the trees are not harvested again and the roads are not used (or until these conditions change).

A Roaded Natural (RN) ROS class describes an area with operational maintenance level 3 and 4 roads, that provide ease of access to other, less developed areas. Sightseeing on level 3 and 4 roads occurs in RN areas, but opportunities are currently declining as maintenance decreases on these roads and as logged areas, which once provided openings for viewing, are filled in with new vegetative growth.

Developed facilities in a RN ROS class provides for a higher level of visitor comfort. Most of the campgrounds on the Forest are in this ROS class and were constructed in the 1960s. The 1960s campground road and spurs were designed so that a camper backed into the campsites. Contemporary recreational vehicles include 60-foot long motor homes that require more space for parking and pull through, rather than back-in, campground spur design. Consequently, the existing Forest facilities do not meet the needs of a portion of our recreating public.

Big game hunting is a traditional late summer-fall activity on the Malheur and Ochoco National Forests, with a large percentage of the use in both the RM and RN ROS classes. Hunters currently account for the majority of Forest recreational users, with large numbers arriving mid to late August for archery season. The numbers fluctuate between and during the seasons, but generally the numbers continue to remain moderate to high starting in August and continuing through the November elk seasons. During the early hunting seasons, all open and drivable roads will be used by the hunters, although fire season restrictions may limit use on lower maintenance level roads that have grasses and other flammable vegetation in the roadway during August and September. As the seasons progress, these roads may become useable again for a short period as precipitation reduces fire hazard but increases the possibility of environmental damage as a result of soft roadbed conditions. As the weather worsens, use becomes concentrated on the higher standard roads. As fewer roads become accessible due to snow, recreational decisions are often influenced by where travel is possible without getting stuck rather than where they really would like to travel. Hunters in the late hunt periods (mid-late November through December) tend to concentrate their use near the main access routes such as County Roads or State Highways. They rely on the assumption that these roads will continue to be maintained (plowed) regardless of snow depth. Use of roads may be the extent of hunter's expected recreation experience or the roads may only be used as a route to a destination. Age and health of the hunter, knowledge of the area and weather conditions may be determining factors for the type of recreation experiences they seek.

Winter recreationists also rely on road access into the RM/RN areas early in the season, starting in late November-early December. They utilize roads that access early snow in the higher elevations. As the depth of winter snowfall increases, recreationists become dependant on plowed roads for access. Plowed access on the Malheur Forest is limited to very few locations. The only designated snow park that is not located on a State Highway is the snow park located on Country Road 62, which allows access to several thousand acres of terrain for snowmobiling and cross country skiing.

The Semi-Primitive Motorized (SPM) class is important for motorized recreation on level 1 and 2 roads and trails in an undeveloped setting. Motorized use is primarily limited to high-clearance, four-wheel and other off-road vehicles. Hunting in this ROS class is primarily during the early hunts such as archery season, deer seasons and the first elk season, since the SPM areas have higher elevations, lower quality roads, are fairly isolated and most recreationists do not wish to be caught or trapped by snow depth. There are no improved camping facilities in this backcountry setting.

The Semi-Primitive Non-motorized (SPNM) class is important for non-motorized recreation in an unroaded setting. All non-motorized activities are allowed in a SPNM ROS setting, but use generally needs some trails, as most visitors are not comfortable making their own way "cross-country" through the timber. The non-wilderness, non-motorized recreation setting allows mountain biking, which is not allowed in wilderness areas. These areas are used during the hunting seasons by hikers in the more easily accessed areas, and by recreationists using stock animals for the more inaccessible areas. In this class, other recreation use outside hunting seasons is sporadic, with the primary recreation activities consisting of stock use, hiking and mountain biking. Some backcountry ski use occurs during the winter season. In SPNM, recreationists rely on access roads to get them to a destination such as a trailhead or in the case of skiers, a "take-off" point.

The Primitive ROS class is important for non-motorized recreation in a primitive setting. The Strawberry Mountain and Monument Rock Wildernesses are within this ROS class. All non-motorized/non-mechanized activities are allowed in a primitive ROS setting, but users generally prefer some trails. These areas generally receive use during the spring, summer and fall seasons, with the highest use occurring in the Strawberry Mountain Wilderness. Hiking and stock use is popular in both areas. Hunting is also a very popular activity in both areas. There is minor winter use in the form of skiing and snowshoeing in the Strawberry Mountain Wilderness. As with SPNM, recreationists rely on the access roads to get them to a destination such as a trailhead.

Recreation trends:

Mountain biking in all but the primitive ROS classes has dramatically increased nationwide since the 1980s and participation rates are expected to continue to grow (Outdoor Recreation Trends). Mountain biking trends on the Malheur Forest have increased but not as fast as the nationwide rate. Mountain bikers use roads where there is a lack of trail opportunities. Many of the bike trails listed in the Mountain Bike Rides on the Malheur National Forest publication utilize a road as part of the trail system. Users prefer a variety of opportunities along a trail, so it is important to consider the ROS and preferred experiences when identifying roads for trail uses.

Horseback riding and hiking are probably the most compatible trail and road activities. In fact, many areas that are otherwise inaccessible by vehicles or bicycles are very accessible by horseback or on foot. Participation rates for hiking have significantly increased over the past few years and are expected to continue to grow. National trends in horseback riding participation rates have decreased steadily (Outdoor Recreation Trends).

Off road driving is another activity showing an increase in participation rates nationwide. There are approximately 47 miles of motorized trail on the forest, but not all of it was constructed to accommodate ATV vehicle widths. In addition to the motorized trails there are approximately 2646 miles of level 1 and 5795 miles of level 2 roads. Many, but not all of the level 1 roads are closed to all motorized use. On most of the level 2 roads, ORV and other type of trail uses are not restricted.

In order to be consistent with changes in the State of Oregon law for OHV's, which provide for user safety for people operating ATVs as well as others that may encounter ATVs under mixed traffic conditions, all paved (hard surface) single or double-lane roads and all double-lane gravel roads are closed to ATVs. In addition, other roads deemed "inappropriate" for mixed ATV/passenger car traffic are posted "closed" to ATV use. The Malheur National Forest also requires the Oregon State Parks and Recreation ATV Decal when operating ATVs on Malheur Forest Lands. Money from the decal sales can be used for trails, including signing and maintenance by applying for project funding with the State of Oregon.

This analysis concludes supply currently meets demand for both unroaded and roaded recreation opportunities on the forest.

UR2 and RR2: Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded (or roaded) recreation opportunities?

In the past 10 years, there has been no new construction of level 3-5 roads into unroaded areas. Most new road construction has been constructing temporary roads, which are

used only as haul routes for timber removal and generally closed after the harvest activities are completed. Roads that have been decommissioned are generally limited to roads that were formerly operational maintenance level 1 or 2. The largest impact to recreationists using level 3-5 roads occurs when these roads are not maintained to standard.

Recreation use has increased over the years and so has the need for the safety of road users on the Forest. In recent years, a large portion of planned road improvements and routine maintenance on level 3-5 roads has not been accomplished due to inadequate funding. Over time, increasing or decreasing routine maintenance can change the frequency and patterns of use. For roads to provide an opportunity for pleasure driving, they need to be pleasurable to drive on. As a result of inadequate funding and reductions in maintenance, the intended comfort level may no longer be experienced on some roads. Over time, they can become unusable for sedans, motor homes or other low-clearance vehicles. In addition, these types of vehicles may sustain an increase in minor vehicle damage, such as flat tires, chipped windshields, and chips to body paint if they continue to try to access recreation areas they have used in the past when road conditions were better. If road conditions continue to deteriorate recreation destinations may depend more on what is practical and safe to access with a particular type of vehicle, rather than the type of recreational activity desired. As roads conditions deteriorate, travelers may need to use high clearance vehicles to access recreation sites, including campgrounds and trailheads, which in the past they might have accessed with low clearance vehicles. If a high clearance vehicle is not available, the destination decision is based more on where they **can** go with the vehicle they have, than by where they really like to travel to. This would tend to segment the recreating public – campgrounds or trailheads accessible by high level or well maintained roads should see an increase in motor homes and sedans or other low clearance vehicles, while facilities accessed by level 3 or lower roads would see predominately high clearance vehicles. This could increase the recreation pressure on those sites most easily accessed, increase the need for facility maintenance at the recreation site, and could increasingly urbanize the related facilities. More Forest Service facilities operations and maintenance dollars would be spent at these high use facilities at the expense of the campgrounds accessed by lower standard or poorly maintained roads. In addition, changing road maintenance levels could have a significant impact on trails and areas accessed by those trails. When a road to a trailhead is maintained to high standards, the trailhead will generally attract a larger variety of users. Use levels would also be higher, which could concentrate use within 1-3 miles of the trailhead, resulting in changes to the local environment. Changes in the amount of use will usually produce a change in the type of recreation users. Recreationists that may have previously experienced solitude in an area may be displaced to a different area if the types or the number of users increases. As the amount of areas accessible by low clearance vehicles decreases, the amount of areas accessible only by high clearance vehicles increases. The perceived quality of the recreation experience may also decrease in association with an increase in use.

Many recreationists that prefer dispersed recreation rather than more developed recreation have already recognized the need to have high clearance vehicles. Since these people rely on what they bring with them they are more flexible about where they go and

how they get there. Changes in road maintenance levels would probably not significantly affect their recreation experience unless a road is unexpectedly closed. If the road to a preferred dispersed campsite is unavailable, use could shift to similar areas nearby. This has the potential to increase impacts to other available areas, particularly if there are a lot of people using an area during the same time period.

Other dispersed recreation uses include firewood cutting and gathering of non-timber forest products such as mushrooms and huckleberries. Participants in these activities rely largely on use of open roads. Decommissioning and closing roads limits the amount of area available for firewood removal, though not all open roads access areas that provide useable firewood. The same can be said for participants picking huckleberries and mushrooms. Motorized access to or near to specific areas is needed to continue huckleberry picking in the most productive, traditional areas. Changing the maintenance level of roads and decommissioning roads would definitely cause substantial changes in the quantity and quality of unroaded (or roaded) recreation opportunities. Elderly or disabled participants in these types of activities would be impacted the most by road closures or decommissioning.

Hunting for shed deer and elk horns is also a popular spring recreation activity. This activity generally takes place when roads are most vulnerable to damage, because they are in wet or saturated conditions. Use of unimproved or poorly maintained roads under these conditions can result in increased sedimentation in creeks and streams, and also cause significant damage to the roadbeds.

UR3 and RR3: What are the effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality and type of unroaded (and roaded) recreation opportunities?

This is not a programmatic issue, and it will be dealt with as site-specific analyses warrant.

UR4 and RR4: Who participates in unroaded (and roaded) recreation in the areas affected by constructing, maintaining, and decommissioning roads?

UR5 and RR5: What are these participants' attachment to the area, how strong are their feelings, and what are alternative opportunities and locations available?

Spring recreationists include horn hunters, bird watchers, turkey hunters and sightseers. Horn hunters seem to prefer roads that access areas that deer and elk frequent – usually areas that have relatively little road traffic in the spring. The roads they prefer to use include many lower standard roads. Turkey hunters seem to prefer similar roads and areas. Bird watchers and sightseers generally stay on the higher standard roads. As snowmelt frees up travel routes, there appear to be specific places people go to bird watch and sightsee. If they have an annual tradition of going to certain places as soon as they are accessible, any change in access would affect their recreation experience. Summer recreationists' account for much of the use in the highly developed recreation sites easily

accessed off level 3-5 roads. Hiking, camping, fishing, horseback riding, sightseeing, and bird watching are some of the main uses normally associated with summer visitors. They generally fall into two categories – visitors new to the area or repeat visitors. Visitors new to the area may have discovered it as they were passing through on the way to somewhere else, or they may have heard about it from a friend or found out about it through on-line services. Repeat visitors may have visited by accident, and enjoyed their first stay so much they keep coming back. They plan their vacation time around a stay at a certain campground or access to an activity such as hiking in the Strawberry Mountain Wilderness. A lot of the users are from outside of the local community, and many come to the Forest because they perceive less use here than what they are used to in more urban areas.

Upland bird hunters are additional hunters using the forests. Most upland bird hunting coincides with the early fall big game hunting seasons. Roads are used to access the uplands for grouse and many hunters have specific areas where they traditionally hunt.

Big game hunters currently account for the majority of the Forest users in both dispersed and developed recreation sites, with large numbers arriving mid to late August for archery season. The numbers may fluctuate somewhat between and during the seasons, but generally the numbers continue to remain moderate to high starting in August and continuing through the November elk seasons. Past experience with hunters has shown a marked preference for traditionally used areas. Many hunters camp in the same dispersed site year after year. Regardless of where they are originally from, many know occupants of neighboring camps and view their hunting trip as a social occasion. Many can trace use of the site to their first hunting trip with their father or grandfather and have strong emotional ties to specific areas. They also have a very strong sense of ‘ownership” of a site and occupancy of a site can make or break their entire trip/experience. The presence of unknown parties within the same dispersed site also can affect their enjoyment of their trip. In some cases, fights have ensued due to the proximity or use of the site by an unknown party.

People also have strong emotional ties to the road system, similar to their attachment to an area or specific site. As roads are closed either by management or lack of maintenance, access to an area or place folks identify with also can make or break their trip. In some cases, they will get there any way they can, even if illegally. For people that maintain strong emotional ties to an area, alternate locations will not immediately meet their needs. Eventually, if required to move to a different area, emotional ties can be forged with the new area. Mention of the old area will still come up in conversation and it may take a generation or more to erase the strong ties some folks have to an area. There is also influx of new hunters each year, for reasons such as overcrowding of their traditional hunting area or because they could not get a tag for their preferred area, or for other reasons. Transitory users of any area would probably not develop strong emotional ties to that area other than either good or bad memories of their recreation experience while there. Alternative locations with similar characteristics would probably meet their recreational needs. In some cases, new use in an area can be the start of a “tradition” for some users.

Additional recreation uses that start in the spring and continue through late fall includes removal of firewood and non-timber forest products such as mushrooms and huckleberries. These activities rely on an open road system. Decommissioning roads would start limiting the amount of area available for firewood removal. Not all open roads access areas that provide useable firewood. The same can be said for huckleberries and mushrooms. Access into specific areas would be needed to continue huckleberry picking in the most productive area since not all areas produce huckleberries. Changing the maintenance level of roads and decommissioning roads would cause substantial changes in the quantity and quality of type of unroaded (or roaded) recreation opportunities. Many folks have very strong emotional ties to specific huckleberry and firewood areas. Since non-timber forest products cannot be found everywhere, alternate opportunities and locations cannot replace where they normally go.

UR6 and RR6: How does the road system affect the Scenic Integrity? How is developing new roads, decommissioning of existing roads, or changing the maintenance of existing roads into unroaded areas affecting the Scenic Integrity?

Scenic integrity is a measure of the wholeness or completeness of the landscape, including the degree of visual deviation from the landscape character valued by constituents. A landscape, which is perceived to have minimal to no deviation from the valued landscape character, is rated as Very High or High Scenic integrity. Those landscapes, which appear to be heavily altered, have low to Very Low scenic integrity. (USDA Forest Service 199

High scenic integrity, which indicates a low level of landscape modification due to a lack of high intensity management activities in the past. Building new roads into these areas would modify the landscape character, thus changing Scenic Integrity from Very High or High to a lower scenic integrity level.

Other road management changes, such as decommissioning roads or reducing the maintenance levels of existing roads, has the potential to produce changes in current Scenic Integrity. Reducing the maintenance of roads can result in visible erosion damage. Increasing road maintenance can ensure better protection and preservation of the existing scenic integrity within the road corridor.

RR-7: How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation? ***(This is the same question that was Social Question #8 in the roads analysis guide – Miscellaneous Report FS 643).***

There are two wilderness areas on the Malheur National Forest. The Strawberry Mountain Wilderness is 68,700 acres and is located entirely on the Malheur National Forest. The Monument Rock Wilderness is located both on the Malheur and the Wallowa-Whitman National Forest, but includes 12,620 acres on the Malheur. There are

no wilderness areas located on the Ochoco National Forest Lands administered by the Malheur. Together, the wilderness areas comprise less than 5 percent of the approximately 1.7 million acres administered by the Malheur National Forest.

When access roads are maintained to higher standards, more people will visit the wilderness. Personal observation is that the sedans and low clearance vehicles will go where they can and the better the road, the larger numbers of people will visit. In areas where the road is rougher, use will be limited to high clearance vehicles. With the increase in the number of "sport utility vehicles" replacing the family station wagon or sedan, the numbers of people using the more primitive roads has increased. Elements or features that attract many recreationists include lakes, campground facilities, and relatively easy access. These elements appeal to families with small children, older recreationists and recreationists passing through to other places. Generally, the access roads that meet these needs will not immediately access primitive areas. Within 1-3 miles of the trailhead, there will be a lot of people. For the more primitive experience, recreationists will generally have to travel further. In areas that are accessed by lower standard roads, opportunities for solitude and primitive recreation will be more readily available. In some areas, this opportunity can happen a few hundred feet to ¼ mile away from the trailhead since not many people may be attracted to the areas if there is a lack of facilities, no lakes or other water bodies, and lower standard roads.

While roads provide access to wilderness and facilitate many authorized recreational uses of them, roads that are in close proximity of the wilderness areas also make access for unauthorized motorized use easier as well. Unauthorized motorized use during both summer and winter periods has been reported in the Monument Rock Wilderness. During the non-winter period, unauthorized vehicle access has been reported in the form of ATVs accessing the Wilderness from the end of open roads adjacent to the Wilderness boundary.

Social Issues (SI)

SI-1: Who are the direct users of the road system and of the surrounding areas? What activities are they directly participating in on the forest? Where are these activities taking place on the Forests.

The direct users of the road system include people from all spectrums of user groups, ranging from preservationists to recreationists to commercial users. Activities also include a full spectrum, including work associated with the woods products industries, grazing activities, recreation activities such as camping, hiking, and hunting, and collecting non-timber forest products. There are few areas on the Forests that are not being utilized for either a commercial or non-commercial activity. Section RR1/UR1 summarizes some of the areas for leisure activities.

SI-2: Why do people value their specific access to national forest and grasslands – what opportunities does access provide?

People value their specific access on the Malheur National Forest for numerous reasons – as an important component of their livelihood, for access to a particular recreation activity, or as a travel route to or from a specific destination.

From a commercial standpoint, timber removal and road access evolved together. An extensive road system reduces costs for commercial activities, and allows for more efficient administration by the government. Grazing permittees' also value motorized access, which allows less costly transportation of livestock and increased operations efficiency compared to having to use non-motorized access to monitor their allotments. Range administration by the government is also more efficient. Other commercial activities such as mining and non-timber forest products also rely on road access for their activities. Under the Mining Law of 1872, citizens have the right to explore for and stake claims to minerals on public domain lands. The Forest Service is required by law to allow reasonable access to people with existing valid mineral rights. Road access to areas that have the proper climate, soils or other specific characteristics for non-timber forest products are also valued by commercial and non-commercial users. People that participate in huckleberry picking, hunting mushrooms, firewood gathering, and posts and poles cutting all rely on access to specific areas, as not all areas can produce these forest products.

Almost all recreation activities rely on some level of road access. Sightseeing, driving outdoors for pleasure, and access to developed areas such as campgrounds or interpretive areas are examples of activities that directly use roads as part of the recreation experience. Activities such as boating or backpacking are examples of activities away from roads, but the user must still use roads as part of those recreational experiences. Road access to trailheads allows further access to still more primitive places where there are opportunities for solitude and personal challenges.

SI-3: What are the broader social and economic benefits and costs of the current forest road system and its management?

The majority of the communities adjacent to the Malheur National Forest are highly dependent on the local forest for wood products, minerals and grazing. Since many of the communities that surround the Malheur National Forest are geographically isolated from larger population centers, there are fewer economic choices available. They are less likely to be economically diverse and more likely to depend heavily on a few major industries for their economic prosperity (ICBEMP 1998 – Economic and Social Conditions of Communities). The primary economic industries are agricultural (including grazing, hunting and forestry), wood products manufacturing, mining and Federal Government. The economic contribution of recreational use of Federal lands is growing. Tourism is becoming more important, contributing to the diversity of the local economy.

The communities and local individuals that rely on the Malheur National Forest have social and economic dependencies on Forest roads and the resources they access. Commercial benefits associated with the current road system include less costly timber harvest methods. As both the density and condition of roads decreases, harvest costs will

increase because of harvest methods, yarding distances, and hauling distances. The current road system also benefits grazing by providing motorized access to allotments and reducing permittee operating costs.

The demand for forest recreational opportunities continues to grow. Increased congestion on a deteriorating road system will eventually result in decreased user satisfaction with both the road and the experience and could increase user conflicts. Recreational activities are closely tied to the current road system, and they also contribute significant revenues to the adjacent communities.
The benefits provided to communities around national forests extend beyond those who directly access or use forest resources. Local businesses benefit through resource activities including timber harvest, grazing, road development and maintenance, water projects, and other special uses in terms of existing and potential economic activity.

Roads are not always viewed as valued or beneficial. Some forest users value the forest mostly for its natural characteristics and view the roads as a detrimental impact.
Others from ethnic groups, subcultures, tribes, national interest groups, as well as local residents of the area can hold cultural, spiritual, sacred, traditional, symbolic, or religious values associated with access to specific places, opportunities or resources on the national forests. These passive use, or indirect use values need to identified and considered along with more use direct values when making road management decisions and changes.

SI-4: How does the road system and road management contribute to of affect people's sense of place?

Roads are the primary means of providing and accessing recreation on the National Forests. Most of the forest roads were built for timber harvesting, livestock trailing, and mining. The majority of these roads, with operational maintenance levels of 2 or lower, were not constructed for the comfort of the traveler or for passenger car traffic. Construction or reconstruction of the higher standard level 3-5 roads, which are constructed for the comfort of the traveler, has been limited by decreasing budgets in recent years, so the number of these roads maintained to standard has been decreasing due to the lack of maintenance funding.

People's sense of place is directly tied to the aspects of an area, including the area within a road corridor, that invoke a special feeling or attachment to an area. Factors include the area's vegetation, the amount of sunlight available, the views, the solitude, the opportunities that make it a destination, and their personal historic use of the area. The road itself facilitates a person's enjoyment of the area by providing for driving comfort, they influences the amount and type of use, and provide access to a number of aesthetic attributes visible alongside the road. These attributes are directly related to road management. Any change in road management or the development of a road without taking these things into consideration will create a change in current use.

Examples of these effects include those used in the discussion in recreation (UR-5 and RR-5). If a road is maintained to a level 3 standard, and the decision is made to upgrade it, more and different users might begin to use the areas it provides access to. This will

change the character for users who consider the area to be special; it will change their experience and may displace current users to other areas for their recreation. Likewise, if a road is currently managed as a level 5 and the decision is made to decrease the maintenance level, the road may not be drivable by certain types of vehicles and the area may become effectively inaccessible for some current users. This may pose a problem for users that have purchased vehicles that provide for comfort rather than high clearance, due to physical limitations or for other reasons. A variety of different people use the existing road system, and they all need to be considered when considering changes to roads and roads management.

SI-5: What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc?

There are several types of conflicts between different types of users. Some of these conflicts include: motorized vs. non-motorized use, hunting/fishing vs. non-consumptive users; resource preservation vs. resource extraction, and recreationists vs. non-recreationists. For many communities in the West, the road system is the backbone of commerce, providing for the movement of products and people through the Forest. Most of the roads on the Forest were built to facilitate log hauling, and logging trucks used to be visible on many of the main roads. Today, the Forest is has less commercial traffic, but recreation traffic has increased. The increased recreation use is helping provide a more diverse economy for communities around the Forest.

Many of the conflicts come from too many types of uses compressed into too few acres. Recreation traffic includes local and non-local users, including many sightseers. Across the National Forest system, studies have indicated that nearly 40% of Forest use is by people who never get out of their vehicles. In addition to congestion, conflicts also arise from the difference in what was expected and what was the reality. If people expect solitude in a place they've hiked to and meet motorized vehicles, their expectations were degraded by what really happened.

In addition to increasing uses, the demographics in the U.S. indicate an ever-increasing urban population (National Survey on Recreation and the Environment 2001 or NSRE). These travelers expect to go long distances in short amounts of time and to be able to get through the Forest in comfort. There are currently about 253 miles of paved or bituminous surfaced roads administered by the Malheur, and an additional 109 miles of roads with either gravel or native surfaces that are maintained to level 4 (for low clearance vehicles with an emphasis on comfort). Maintenance is increasingly important to facilitating the demands of these users. While commodity production from forests has decreased, recreation use has increased and contributes significantly to the overall economic health of local communities. As populations continue to increase around Oregon and as forests adjacent to the larger population centers become more congested, the Malheur National Forest is expected to become a more popular destination. The forest may be perceived as less crowded with more opportunities. This, in turn, will lead to more pressure on the road system, and an increase in user conflicts. As congestion

continues to grow, the number of conflicts between users and values could increase or result in new types use conflicts. For some local recreationists, tourism traffic has become more of an annoyance than the periodic logging trucks. Tourism is a double-edged sword; for every comment that tourism is a benefit to the economy, there's a comment that "we don't need the crowding".

SI-6: What are the traditional uses of animal and plant species in the area of analysis?

A number of American Indian and non-indigenous groups have traditionally used game animals, fish and plants found on the Malheur Forest. Several references provide overview lists of specific plants and animals used by American Indian groups (Couture 1996, D'Azevedo 1986, Walker 1998). The specific species used vary by location on the Forest. Public outreach and tribal consultation for specific project planning should identify the species relevant to the particular project. Consultation with appropriate American Indian groups is critical. Tribes consulted with on a regular basis by the Malheur National Forest are the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation and the Klamath Tribes.

Cultural and Heritage (CH)

CH-1: How does the road system affect access to paleontological, archaeological, and historical sites and the values people hold for these sites?

There are over 6,000 paleontological, archaeological, and historic sites recorded on the Forest, and an unknown number of unrecorded sites. Most of these are accessible from forest roads. In general, the less accessible these sites are, the less likely they are to be damaged through looting or accidental impacts. Only four sites have been developed for public visitation. Three of these are along major paved roads and lack of access is unlikely to be a problem. The fourth is located along a hiking trail and access will only be a problem if the Forest decides to close the trail. Specific decisions regarding the effects of road construction or closure need to be addressed at the project specific level. Limiting access to the 215 sites on the Forest's Priority Heritage Access List will generally be the preference from a Heritage perspective.

CH–2: How does the road system and road management affect the exercise of American Indian treaty rights?

There are no specially designated areas that allow for or prohibit American Indian use, so the current road system is not known to either prohibit or encourage plant gathering by indigenous peoples or access to traditional sites.

Access for tribal members, for hunting, fishing, plant gathering, and other traditional uses can be a significant issue to the tribes. Specific decisions regarding the effects of road construction or closure need to continue to be addressed at the project specific level. Consultation with appropriate American Indian groups is critical. Tribes consulted with on a regular basis by the Malheur National Forest include the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation and the Klamath Tribes.

CH–3: How does road use and road management affect roads that constitute historic sites:

Only two intact historic road segments have been identified on the Forest to date. These are not part of existing road systems. Occasionally, historic road components such as bridges, wooden culverts and cattle guards are located. Several segments of historic railroad grades have been converted to forest roads. In most cases the historic integrity of these segments has been so reduced as to render them ineligible for inclusion on the National Register of Historic Places. The historic significance of these sites and features, and the possible effects of road management decisions, needs to be addressed at the project specific level.

Civil Rights, and Environmental Justice (CR)

CR-1: How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)? road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations?

The existing road system is used by all groups of people. Changes in road management, including closing or decommissioning of any of the roads would have the same effect on all groups of people, including minorities and different cultures.

Road system management can affect any of these groups. Identification of affected groups and specific locations and issues will take place during project specific roads analysis.